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AVIATION MECHANIC

POWERPLANT

WRITTEN TEST BOOK

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**Federal Aviation
Administration**

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AVIATION MECHANIC POWERPLANT
WRITTEN TEST BOOK

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Office of Aviation System Standards

PREFACE

This written test book has been developed by the Federal Aviation Administration (FAA) to be used by FAA testing centers and FAA designated written test examiners for testing applicants in the following knowledge area:

Aviation Mechanic Powerplant

Applicants may use this written test book as a study guide. It is issued as FAA-T-8080-11D, Aviation Mechanic Powerplant Written Test Book, and is available to the public from:

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

or from U.S. Government Printing Office bookstores located in major cities throughout the United States.

The questions included in this publication are predicated on regulations, references, principles, and practices that were valid at the time of publication. The question selection sheets prepared for use with this written test book are security items and are revised at frequent intervals.

The FAA does NOT publish, supply, or make available, the correct answers to questions included in this written test book. Students should determine the correct answers through research and study of appropriate subject material, by working with instructors, or by attending appropriate schools. The FAA is NOT responsible for either the content of commercial reprints of this written test book, or the accuracy of any answers they may supply.

Comments regarding this publication should be directed to:

Federal Aviation Administration
Operations Standards Development Section, AVN-131
P.O. Box 25082
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CONTENTS

Page

Preface iii
Contents v
General Instructions vii
Introduction to the Aviation Mechanic Powerplant Written Test Book ix
Questions 1

APPENDIX 1

Subject Matter Knowledge Codes 1
Abbreviations and References 3

APPENDIX 2

FIGURE 1.—Fire Extinguisher Pressure Chart 1
FIGURE 2.—Fire Extinguisher Pressure Chart 1
FIGURE 3.—Electric Wire Chart 2
FIGURE 4.—Fuel/Air Ratio Graphs 3
FIGURE 5.—Fuel System 3

GENERAL INSTRUCTIONS

MAXIMUM TIME ALLOWED FOR TEST: 4 HOURS

Maximum time allowed for each test is based upon previous experience and educational statistics. This time is considered more than adequate for applicants with proper preparation and instruction.

MATERIALS

Materials to be used with this written test book when used for airman certification testing:

1. AC Form 8080-3, Airman Written Test Application, which includes the answer sheet.

2. Question selection sheet which identifies the questions to be answered.

3. Plastic overlay sheet which can be placed over electrical drawings, graphs, and charts for plotting purposes.

TEST INSTRUCTIONS

1. Read the instructions on page 1 of AC Form 8080-3, and complete page 4 of the form. Incomplete or erroneous personal information entered on this form delays the scoring process.

2. The questions in this written test book are numbered consecutively beginning with 7001. Refer to the question selection sheet to determine which questions to answer.

3. For each question number on the answer sheet, find the appropriate question in the written test book.

4. Mark your answer in the space provided for each question number on the answer sheet. Spaces 1, 2, 3, or 4 left unmarked will be counted by the computer scanner as a miss.

5. The test questions are of the multiple-choice type. Until revised, answer sheets contain selections listed as 1, 2, 3, and 4 and should be interpreted as A, B, C, and D respectively.

6. The supplementary material required to answer the questions will be found in appendix 2.

7. Read each question carefully and avoid hasty assumptions. Do not answer until you understand the question. Do not spend too much time on any one question. Answer all of the questions that you readily know and then reconsider those you find difficult. Be careful to make any necessary conversions.

8. If a regulation or procedure is changed after this written test book is printed, you will receive credit for the affected question.

DO NOT USE THIS BOOK UNLESS IT CORRESPONDS WITH THE BOOK NUMBER ON THE TEST.

THE MINIMUM PASSING GRADE IS 70.

WARNING

§65.18 Written tests: cheating or other unauthorized conduct.

(a) Except as authorized by the Administrator, no person may—
(1) Copy, or intentionally remove, a written test under this Part;
(2) Give to another, or receive from another, any part or copy of that test;
(3) Give help on that test to, or receive help on that test from, any person during the period that test is being given;
(4) Take any part of that test in behalf of another person;
(5) Use any material or aid during the period that test is being given; or
(6) Intentionally cause, assist, or participate in any act prohibited by this paragraph.
(b) No person who commits an act prohibited by paragraph (a) of this section is eligible for any airman or ground instructor certificate or rating under this chapter for a period of one year after the date of that act. In addition, the commission of that act is a basis for suspending or revoking any airman or ground instructor certificate or rating held by that person.

INTRODUCTION TO THE AVIATION MECHANIC POWERPLANT WRITTEN TEST BOOK

This written test book presents the FAA Aviation Mechanic Powerplant written tests. The requirements for a mechanic certificate and ratings, and the privileges, limitations, and general operating rules for certificated mechanics are prescribed in Federal Aviation Regulation (FAR) Part 65, Certification: Airmen Other Than Flight Crewmembers. Any person who applies and meets the requirements is entitled to a mechanic certificate.

Question selection sheets are used in conjunction with this written test book to administer the proper written test to each applicant. Each test is constructed from the questions included in this written test book.

The written test book is scheduled for revision each 24 months. Associated question selection sheets will be revised periodically, as required.

Testing and Scoring

The written test may be taken at FAA testing centers, FAA written test examiner's facilities, or other designated places.

The applicant is issued a "clean copy" of this written test book, an appropriate question selection sheet indicating the specific questions to be answered, and AC Form 8080-3, Airman Written Test Application, which includes the answer sheet. The written test book contains all supplementary material required to answer the questions. Supplementary material is located in appendix 2.

Instructions for completing the test are contained on page vii of this written test book.

Upon completion of the test, the applicant must surrender the issued written test book, question selection sheet, answer sheet, and any papers used for computations or notations to the monitor before leaving the test room.

The answer sheet is sent to the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma, where it is scored by computer. The applicant is then issued AC Form 8080-2, Airman Written Test Report. This form will list the test score and subject matter knowledge codes referencing the subjects in which the applicant is deficient. Retain AC Form 8080-2 to be presented for oral and practical testing, or for retesting in the event of written test failure.

The written test subject matter knowledge codes are then matched to the corresponding subject matter knowledge areas published in appendix 1 of this written test book. The applicant should review those subject areas until proficient. The applicant must obtain a written statement from an appropriately certificated mechanic stating that he/she has satisfactory knowledge of the subject areas shown to be deficient on AC Form 8080-2. In addition, the applicant may be retested in those subject areas by the mechanic.

The applicant should be aware that a subject matter code on AC Form 8080-2 appears only once even though more than one question may have been missed in that subject area. Therefore, the number of subject matter codes on AC Form 8080-2 may not represent the number of questions missed on the test.

When taking the test, the applicant should keep the following points in mind:

1. Answer each question in accordance with the latest regulations and procedures.

2. Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.

3. After formulating an answer, determine which of the alternatives most nearly corresponds with that answer. The answer chosen should completely resolve the problem.

4. From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete or are derived from popular misconceptions.

5. If a certain question is difficult for you, it is best to proceed to other questions. After you answer the less difficult questions, return to those which gave you difficulty. Be sure to indicate on your question selection sheet the questions to which you wish to return.

6. When solving a calculator problem, select the answer nearest your solution. If you have solved it correctly, your answer will be closer to the correct answer than to any of the other choices.

7. To aid in scoring, enter personal data in the appropriate spaces on the test answer sheet in a complete and legible manner. Be sure to enter the test number exactly as printed on the question selection sheet.

Retesting after Failure—FAR Section 65.19

An applicant for a written, oral, or practical test for a certificate and rating, or for an additional rating under this part, may apply for retesting–

(a) After 30 days after the date the applicant failed the test; or

(b) Before the 30 days have expired if the applicant presents a signed statement from an airman holding the certificate and rating sought by the applicant, certifying that the airman has given the applicant additional instruction in each of the subjects failed and that the airman considers the applicant ready for retesting.

QUESTIONS

7001. Which statement is true regarding bearings used in high-powered reciprocating aircraft engines?

A— The outer race of a single-row, self-aligning ball bearing will always have a radius equal to the radius of the balls.
B— There is less rolling friction when ball bearings are used than when roller bearings are employed.
C— Crankshaft bearings are generally of the ball-type due to their ability to withstand extreme loads without overheating.
D— Crankshaft bearings are generally of the ball-type due to their ability to withstand loads. However, some manufacturers object to their use because this type bearing requires a positive high-pressure oil supply.

7002. Which propeller reduction gear ratio will cause the highest propeller RPM? (Assume the same engine RPM in each case.)

A— 16:7.
B— 16:9.
C— 20:9.
D— 3:2.

7003. Which condition would be the least likely to be caused by failed or failing engine bearings?

A— Excessive oil consumption.
B— High oil temperatures.
C— Low oil temperatures.
D— Low oil pressure.

7004. What is the principle advantage of using propeller reduction gears?

A— To enable the propeller RPM to be increased without an accompanying increase in engine RPM.
B— The diameter and blade area of the propeller can be increased.
C— To enable the engine RPM to be increased with an accompanying increase in power and allow the propeller to remain at a lower, more efficient RPM.
D— To enable the engine RPM to be increased with an accompanying increase in propeller RPM.

7005. Which of the following will decrease volumetric efficiency of a reciprocating engine?

A— High fuel octane rating.
B— Short intake pipes of large diameter.
C— Low carburetor air temperature.
D— High cylinder head temperature.

7006. Which of the following is a characteristic of a thrust bearing used in most radial engines?

A— Tapered roller.
B— Double-row ball.
C— Double-row straight roller.
D— Deep-groove ball.

7007. Which bearing is least likely to be a roller or ball bearing?

A— Rocker arm bearing (overhead valve engine).
B— Master rod bearing (radial engine).
C— Crankshaft main bearing (radial engine).
D— Generator armature bearing.

7008. The horsepower developed in the cylinders of a reciprocating engine is known as the

A— shaft horsepower.
B— indicated horsepower.
C— brake horsepower.
D— thrust horsepower.

7009. A nine-cylinder engine with a bore of 5.5 inches and a stroke of 6 inches will have a total piston displacement of

A— 740 cubic inches.
B— 1,425 cubic inches.
C— 23,758 cubic inches.
D— 1,283 cubic inches.

7010. The five events of a four-stroke cycle engine in the order of their occurrence are

A— intake, ignition, compression, power, exhaust.
B— intake, power, compression, ignition, exhaust.
C— intake, compression, ignition, power, exhaust.
D— intake, ignition, power, compression, exhaust.

7011. The primary concern in establishing the firing order for an opposed engine is to

A— provide for balance and eliminate vibration to the greatest extent possible.
B— achieve the highest cruising speed torque.
C— keep power impulses on adjacent cylinders as far apart as possible in order to obtain the greatest mechanical efficiency.
D— keep the power impulse on adjacent cylinders as close as possible in order to obtain the greatest mechanical efficiency.

7012. If fuel/air ratio is proper and ignition timing is correct, the combustion process should

A— be completed 20 to 30° before top center at the end of the compression stroke.
B— be completed when the exhaust valve opens at the end of the power stroke.
C— continue until the end of the exhaust stroke.
D— be completed just after top center at the beginning of the power stroke.

7013. The clearance between the rocker arm and the valve tip affects how many of the following?

1. Point at which valve opens.
2. Height of valve opening.
3. Duration of valve opening.

A— One.
B— Two.
C— Three.
D— None.

7014. Which statement is correct regarding engine crankshafts?

A— Counterweights reduce torsional vibrations.
B— Counterweights provide static balance.
C— A six-throw crankshaft utilizes three dynamic dampers.
D— Dynamic dampers are designed to resonate at the natural frequency of the crankshaft.

7015. On which stroke or strokes are both valves on a four-stroke cycle reciprocating engine cylinder open?

A— Exhaust.
B— Intake.
C— Power and intake.
D— Exhaust and intake.

7016. Master rod bearings are generally what type?

A— Plain.
B— Roller.
C— Ball.
D— Tapered roller.

7017. The actual power delivered to the propeller of an aircraft engine is called

A— friction horsepower.
B— brake horsepower.
C— mechanical efficiency.
D— indicated horsepower.

7018. Cam-ground pistons are installed in some aircraft engines to

A— provide a better fit at operating temperatures.
B— cause the master rod piston to wear at the same rate as those installed on the articulating rods.
C— act as a compensating feature so that a compensated magneto is not required.
D— equalize the wear on pistons that do not operate in a vertical plane.

7019. Using the following information, determine how many degrees the crankshaft will rotate with both the intake and exhaust valves seated.

Intake opens 15° BTDC.
Exhaust opens 70° BBDC.
Intake closes 45° ABDC.
Exhaust closes 10° ATDC.

A— 610°.
B— 290°.
C— 245°.
D— 25°.

7020. Some aircraft engine manufacturers equip their product with choked or taper-ground cylinders. The reason choke-type cylinders are used is to

A— provide a straight cylinder bore at operating temperature.
B— reduce the possibility of piston rings sticking in the ring groves.
C— compensate for normal cylinder barrel wear.
D— increase the compression pressure for starting purposes.

7021. An overhead valve engine using zero-lash hydraulic valve lifters is observed to have no clearance in its valve-operating mechanism after the minimum inlet oil and cylinder head temperatures for takeoff have been reached. When can this condition be expected?

A— During normal operation.
B— When the lifters become deflated.
C— As a result of carbon and sludge becoming trapped in the lifter and restricting its motion.
D— As a result of inverting the tappet valve during assembly of the lifter.

7022. What tool is generally used to measure the crankshaft rotation in degrees?

A— Dial indicator.
B— Top-center indicator.
C— Timing disk.
D— Timing light.

7023. If an engine with a stroke of 6 inches is operated at 2,000 RPM, the piston movement within the cylinder will

A— be at maximum velocity around TDC.
B— be constant during the entire 360° of crankshaft travel.
C— be at maximum velocity 90° after TDC.
D— average approximately 60 MPH.

7024. If the intake valve is opened too early in the cycle of operation of a four-stroke cycle engine, it may result in

A— improper scavenging of exhaust gases.
B— engine kickback.
C— backfiring into the induction system.
D— incomplete compression.

7025. The inside of some cylinder barrels is hardened by

A— nitriding.
B— shot peening.
C— nickel plating.
D— cadmium plating.

7026. Which statement is correct regarding a four-stroke cycle aircraft engine?

A— The intake valve closes on the compression stroke.
B— The exhaust valve opens on the exhaust stroke.
C— The intake valve opens on the intake stroke.
D— The exhaust valve closes on the exhaust stroke.

7027. On which part of the cylinder walls of a normally operating engine will the greatest amount of wear occur?

A— On the lower walls of the cylinders that are installed horizontally.
B— Near the center of the cylinder where piston velocity is greatest.
C— Near the top of the cylinder.
D— Near the bottom of the cylinder.

7028. During overhaul, reciprocating engine intake and exhaust valves are checked for stretch

A— with a suitable outside micrometer caliper.
B— with a contour gauge.
C— with a suitable vernier caliper.
D— by placing the valve on a surface plate and measuring its length with a vernier height gauge.

7029. When is the fuel/air mixture ignited in a conventional reciprocating engine?

A— When the piston has reached top dead center of the intake stroke.
B— Just as the piston begins the power stroke.
C— Shortly before the piston reaches the top of the compression stroke.
D— When the piston reaches top dead center on the compression stroke.

7030. Ignition occurs at 28° BTDC on a certain four-stroke cycle engine, and the intake valve opens at 15° BTDC. How many degrees of crankshaft travel after ignition does the intake valve open? (Consider one cylinder only.)

A— 707°.
B— 373°.
C— 347°.
D— 13°.

7031. What is the purpose of the safety circlet installed on some valve stems?

A— To hold the valve guide in position.
B— To hold the valve spring retaining washer in position.
C— To prevent exhaust gases from entering the rocker box chamber.
D— To prevent valves from falling into the combustion chamber.

7032. Valve overlap is defined as the number of degrees of crankshaft travel

A— during which both valves are off their seats.
B— between the closing of the intake valve and the opening of the exhaust valve.
C— during which both valves are on their seats.
D— between the closing of the exhaust valve and the opening of the intake valve.

7033. When timing the valves of a fully assembled radial engine, what will be the result of failure to eliminate any backlash that may exist in the mechanism?

A— Valve lift will be less than specified.
B— Inaccurate valve timing.
C— Valve lift will be more than specified.
D— Valve lap will be reduced.

7034. The operating valve clearance of an engine using hydraulic tappets (zero lash lifters) should not exceed

A— 0.15 to 0.18 inch.
B— 0.00 inch.
C— 0.25 to 0.32 inch.
D— 0.30 to .110 inch.

7035. If the exhaust valve of a four-stroke cycle engine is closed and the intake valve is just closing, the piston is on the

A— intake stroke.
B— power stroke.
C— exhaust stroke.
D— compression stroke.

7036. How many of the following are factors in establishing the maximum compression ratio limitations of an aircraft engine?

1. Detonation characteristics of the fuel used.
2. Design limitations of the engine.
3. Degree of supercharging.
4. Spark plug reach.

A— One.
B— Four.
C— Two.
D— Three.

7037. Full-floating piston pins are those which allow motion between the pin and

A— the connecting rod.
B— the piston.
C— both the piston and the large end of the connecting rod.
D— both the piston and the small end of the connecting rod.

7038. The primary purpose in setting proper valve timing and overlap is to

A— promote ease of starting.
B— permit the best possible charge of fuel/air mixture into the cylinders.
C— gain more thorough exhaust gas scavenging.
D— obtain the best volumetric efficiency and lower cylinder operating temperatures.

7039. If the hot clearance is used to set the valves when the engine is cold, what will occur during operation of the engine?

A— The valves will open early and close early.
B— The valves will open late and close early.
C— The valves will open early and close late.
D— No ill effects will occur.

7040. The purpose of two or more valve springs in aircraft engines is to

A— reduce valve stretch.
B— equalize side pressure on the valve stems.
C— eliminate valve spring surge.
D— eliminate valve stem breakage.

7041. During overhaul, the disassembled parts of an engine are usually degreased with some form of mineral spirits solvent rather than water-mixed degreasers primarily because

A— solvent degreasers are much more effective.
B— solvent degreasers are more economical to buy.
C— water-mixed degreaser residues may cause engine oil contamination in the overhauled engine.
D— water-mixed degreasers cause corrosion.

7042. Why does the smoothness of operation of an engine increase with a greater number of cylinders?

A— The power impulses are spaced closer together.
B— The engine is heavier.
C— The number of cylinders has nothing to do with the smoothness of operation.
D— The engine has larger counterbalance weights.

7043. Compression ratio is the ratio between the

A— piston travel on the compression stroke and on the intake stroke.
B— combustion chamber pressure on the combustion stroke and on the exhaust stroke.
C— cylinder volume with piston at bottom dead center and at top dead center.
D— fuel and air in the combustion chamber.

7044. If the crankshaft runout readings on the dial indicator are plus .002 inch and minus .003 inch, the runout is

A— .005 inch.
B— .001 inch.
C— plus .001 inch.
D— minus .001 inch.

7045. (1) Only cast iron piston rings can be used in nitrided or chrome-plated cylinders.

(2) Chrome-plated rings may be used in plain steel cylinders.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— neither No. 1 nor No. 2 is true.
D— both No. 1 and No. 2 are true.

7046. How is proper end-gap clearance on new piston rings assured during the major overhaul of an engine?

A— By using a go and no-go gauge.
B— By using rings specified by the engine manufacturer.
C— By placing the rings in the cylinder and measuring the end-gap with a feeler gauge.
D— By grinding the rings on an emery wheel.

7047. The volume of a cylinder equals 70 cubic inches when the piston is at bottom center. When the piston is at the top of the cylinder, the volume equals 10 cubic inches. What is the compression ratio?

A— 10:7.
B— 1:7.
C— 7:10.
D— 7:1.

7048. When cleaning aluminum and magnesium engine parts, it is inadvisable to soak them in solutions containing soap because

A— soaps are not as effective as solvents.
B— some of the soap may become impregnated in the metal pores and cause engine oil contamination and foaming.
C— the soap will chemically alter the metal surface causing it to stain and discolor at operating temperatures.
D— the soap will chemically alter the metal surface causing it to weaken at operating temperatures.

7049. What is the purpose of a power check on a reciprocating engine?

A— To check magneto drop.
B— To check the propeller governor.
C— To determine satisfactory performance.
D— To determine if the fuel/air mixture is adequate.

7050. What will be the likely result if the piston ring gaps happen to be aligned when performing a differential-pressure compression check on a cylinder?

A— Little or no effect.
B— The rings will not be seated.
C— A worn or defective ring(s) indication.
D— The rings will have an increased tendency to stick.

7051. Which of the following will be caused by excessive valve clearance of a cylinder on a reciprocating aircraft engine?

A— Reduced valve overlap period.
B— Increased cylinder pressure on the power stroke.
C— Intake and exhaust valves will open early and close late.
D— A power increase by shortening the exhaust event.

7052. The floating control thermostat is adjusted to maintain a normal engine oil temperature that will not vary more than approximately

A— 5 to 8 °F.
B— 10 to 13 °F.
C— 10 to 13 °C.
D— 5 to 8 °C.

7053. Which of the following would indicate a general weak-engine condition when operated with a fixed-pitch propeller or test club?

A— Oil pressure lower at idle RPM than at cruise RPM.
B— Lower than normal static RPM, full throttle operation.
C— Manifold pressure lower at idle RPM than at static RPM.
D— Lower than normal manifold pressure for any given RPM.

7054. Which of the following is required by FAR Part 43 when performing a 100-hour inspection on reciprocating engines?

A— Magneto timing check.
B— Cylinder compression check.
C— Valve timing check.
D— Crankshaft runout check.

7055. After spark plugs from an opposed engine have been serviced, in what position should they be re-installed?

A— The same hole from which they were removed.
B— Next in firing order to the one from which they were removed.
C— Swapped bottom to top.
D— Next in firing order to the one from which they were removed and swapped bottom to top.

7056. As the pressure is applied during a reciprocating engine compression check using a differential pressure tester, what would a movement of the propeller in the direction of engine rotation indicate?

A— The piston was positioned ahead of top dead center.
B— The piston was on compression stroke.
C— The piston was on intake stroke.
D— The piston was positioned past top dead center.

7057. Excessive valve clearance results in the valves opening

A— early and closing early.
B— late and closing early.
C— early and closing late.
D— late and closing late.

7058. During routine inspection of a reciprocating engine, a deposit of small, bright, metallic particles which do not cling to the magnetic drain plug is discovered in the oil sump and on the surface of the oil filter. This condition

A— may be a result of abnormal plain type bearing wear and is cause for further investigation.
B— indicates accessory section gear wear and is cause for removal and/or overhaul.
C— is probably a result of ring and cylinder wall wear and is cause for engine removal and/or overhaul.
D— is normal in engines utilizing plain type bearings and aluminum pistons and is not cause for alarm.

7059. What is the minimum number of crankshaft revolutions required to cause the five-lobe cam plate of a nine-cylinder radial engine to turn one complete revolution?

A— Ten.
B— Two.
C— Four and one-half.
D— Five.

7060. A characteristic of dyna-focal engine mounts as applied to aircraft reciprocating engines is that the

A— shock mounts eliminate the torsional flexibility of the powerplant.
B— design of the shock mounts makes the powerplant installation more rigid.
C— engine attaches to the shock mounts at the engine's center of gravity.
D— shock mounts point toward the engine's center of gravity.

7061. If metallic particles are found on the oil screen during an engine inspection,

A— it is an indication of normal engine wear unless the particles are nonferrous.
B— the cause should be identified and corrected before the aircraft is released for flight.
C— it is an indication of normal engine wear unless the deposit exceeds a specified amount.
D— it is an indication of normal engine wear unless the particles show ferritic content (respond to a magnet).

7062. If the oil pressure gauge fluctuates over a wide range from zero to normal operating pressure, the most likely cause is

A— malfunction of the thermostatic control valve.
B— low oil supply.
C— broken or weak pressure relief valve spring.
D— air lock in the scavenge pump intake.

7063. What special procedure must be followed when adjusting the valves of an engine equipped with a floating cam ring?

A— Adjust valves when the engine is hot.
B— Adjust all exhaust valves before intake valves.
C— Eliminate cam bearing clearance when making valve adjustment.
D— Adjust all intake valves before exhaust valves.

7064. Which of the following is most likely to occur if an overhead valve engine is operated with inadequate valve clearances?

A— The valves will not open during start and engine warmup.
B— The valves will remain closed for longer periods than specified by the engine manufacturer.
C— The valves will not seat positively during start and engine warmup.
D— The further decrease in valve clearance that occurs as engine temperatures increase will cause damage to the valve-operating mechanism.

7065. Excessive valve clearances will cause the duration of valve opening to

A— increase for both intake and exhaust valves.
B— decrease for both intake and exhaust valves.
C— decrease for intake valves and increase for exhaust valves.
D— increase for intake valves and decrease for exhaust valves.

7066. What does valve overlap promote?

A— Lower intake manifold pressure and temperatures.
B— A backflow of gases across the cylinder.
C— An overlap of the power and intake strokes.
D— Better scavenging and cooling characteristics.

7067. The indicated oil pressure of a particular dry-sump aircraft engine is higher at cruise RPM than at idle RPM. This indicates

A— defective piston-oil control rings.
B— excessive relief-valve spring tension.
C— an insufficient oil supply.
D— normal operation.

7068. At what speed must a crankshaft turn if each cylinder of a four-stroke cycle engine is to be fired 200 times a minute?

A— 200 RPM.
B— 800 RPM.
C— 1,600 RPM.
D— 400 RPM.

7069. Crankshaft runout is checked

A— after each flight and after a 30-day layoff.
B— during engine overhaul and in case of sudden stoppage of the engine.
C— during engine overhaul and anytime it is convenient.
D— if the propeller is too noisy and vibrates.

7070. Before attempting to start a radial engine that has been shut down for more than 30 minutes,

A— place the fuel selector valve in the OFF position.
B— pull the propeller through by hand in the opposite direction of normal rotation to check for liquid lock.
C— turn the ignition switch on before energizing the starter.
D— turn the propeller three to four revolutions in the normal direction of rotation to check for liquid lock.

7071. Which of the following cam rings will turn the slowest relative to the crankshaft?

A— One-lobe cam ring used on a 14-cylinder engine.
B— Two-lobe cam ring used on a five-cylinder engine.
C— Three-lobe cam ring used on a seven-cylinder engine.
D— Four-lobe cam ring used on a nine-cylinder engine.

7072. An engine misses in both the right and left positions of the magneto switch. The quickest method for locating the trouble is to

A— check for cold cylinders to isolate the trouble.
B— perform a compression check.
C— check for a weak breaker spring in the magneto.
D— check each spark plug.

7073. A hissing sound from the exhaust stacks when the propeller is being pulled through manually indicates

A— a cracked exhaust stack.
B— exhaust valve blow-by.
C— worn piston rings.
D— liquid lock.

7074. If the oil pressure of a cold engine is higher than at normal operating temperatures, the

A— oil system relief valve should be readjusted.
B— engine's lubrication system is probably operating normally.
C— oil dilution system should be turned on immediately.
D— engine should be shut down immediately.

7075. If an engine operates with a low oil pressure and a high oil temperature, the problem may be caused by a

A— low setting of the oil thermostat.
B— leaking oil dilution valve.
C— sheared oil pump shaft.
D— clogged oil cooler annular jacket.

7076. Which fuel/air mixture will result in the highest engine temperature (all other factors remaining constant)?

A— A mixture leaner than a rich best-power mixture of .085.
B— A mixture richer than a lean best-power mixture of .075.
C— A mixture richer than a full-rich mixture of .087.
D— A mixture leaner than a manual lean mixture of .060.

7077. If an engine cylinder is to be removed, at what position in the cylinder should the piston be?

A— Bottom dead center.
B— Top dead center.
C— Halfway between top and bottom dead center.
D— Any convenient position.

7078. The operating valve clearance of a radial engine as compared to cold valve clearance is

A— greater.
B— less.
C— the same.
D— greater or less depending on the type of valve used.

7079. What is the firing order for a nine-cylinder radial engine?

A— 1, 2, 3, 4, 5, 6, 7, 8, 9.
B— 1, 2, 3, 8, 4, 7, 5, 6, 9.
C— 1, 3, 5, 7, 9, 2, 4, 6, 8.
D— 9, 4, 2, 7, 5, 6, 3, 1, 8.

7080. Engine operating flexibility is the ability of the engine to

A— deliver maximum horsepower at a specific altitude.
B— meet exacting requirements of efficiency and low weight per horsepower ratio.
C— run smoothly and give the desired performance at all speeds.
D— expand and contract with changes in temperature and pressure.

7081. Standard aircraft cylinder oversizes usually range from 0.010 inch to 0.030 inch. Oversize on automobile engine cylinders may range up to 0.100 inch. This is because aircraft engine cylinders

A— are limited as to the range of piston sizes available.
B— have relatively thin walls and may be nitrided.
C— cannot have ridging removed by grinding.
D— operate at high temperatures.

7082. If the ignition switch is moved from BOTH to either LEFT or RIGHT during an engine ground check, normal operation is usually indicated by

A— a large drop in RPM.
B— a slight increase in RPM.
C— no change in RPM.
D— a slight drop in RPM.

7083. During ground check an engine is found to be rough-running, the magneto drop is normal, and the manifold pressure is higher than normal for any given RPM. The trouble may be caused by

A— a loose connection on the high-tension lead to one magneto.
B— several spark plugs fouled on different cylinders.
C— a leak in the intake manifold.
D— a dead cylinder.

7084. What is the best indication of worn valve guides?

A— High oil consumption.
B— Low compression.
C— Low oil pressure.
D— High oil pressure.

7085. By use of a differential pressure compression tester, it is determined that the No. 3 cylinder of a nine-cylinder radial engine will not hold pressure after the crankshaft has been rotated 260° from top dead center compression stroke No. 1 cylinder. How can this indication usually be interpreted?

A— Badly worn or damaged piston rings.
B— A normal indication.
C— Exhaust valve blow-by.
D— A damaged exhaust valve or insufficient exhaust valve clearance.

7086. When does valve overlap occur in the operation of an aircraft reciprocating engine?

A— At the end of the exhaust stroke and the beginning of the intake stroke.
B— At the end of the power stroke and the beginning of the exhaust stroke.
C— At the end of the intake stroke and the beginning of the compression stroke.
D— At the end of the compression stroke and the beginning of the power stroke.

7087. What is an advantage of using metallic-sodium filled exhaust valves in aircraft reciprocating engines?

A— Increased resistance to corrosive gases.
B— Increased strength and resistance to fatigue.
C— Reduced valve operating temperatures.
D— Greater resistance to deterioration at high valve temperatures.

7088. Valve clearance changes on opposed-type engines using hydraulic lifters are accomplished by

A— rocker arm adjustment.
B— rocker arm replacement.
C— adding or removing valve stem shims.
D— push rod replacement.

7089. What is likely to occur if a reciprocating engine is operated at high power settings before it is properly warmed up?

A— Oil starvation of bearings and other parts.
B— Excessive thinning of the engine oil.
C— Oil flooding of bearings and other parts.
D— Accelerated oil breakdown and oxidation.

7090. An increase in manifold pressure with a constant RPM will cause the bearing load in an engine to

A— decrease.
B— remain the same.
C— cannot be determined from the given information.
D— increase.

7091. Direct mechanical push-pull carburetor heat control linkages should normally be adjusted so that the stop located on the diverter valve will be contacted

A— before the stop at the control lever is reached in both HOT and COLD positions.
B— before the stop at the control lever is reached in the HOT position and after the stop at the control lever is reached in the COLD position.
C— after the stop at the control lever is reached in both HOT and COLD positions.
D— after the stop at the control lever is reached in the HOT position and before the stop at the control lever is reached in the COLD position.

7092. Reduced air density at high altitude has a decided effect on carburetion, resulting in a reduction of engine power by

A— excessively enriching the fuel/air mixture.
B— excessively leaning the fuel/air mixture.
C— decreasing the volatility of the fuel.
D— increasing the pressure differential between the carburetor and the intake manifold.

7093. Increased water vapor (higher relative humidity) in the incoming air to a reciprocating engine will normally result in which of the following?

A— Decreased engine power at a constant RPM and manifold pressure.
B— Increased power output due to increased volumetric efficiency.
C— Reduced fuel flow requirements at high-power settings due to reduced detonation tendencies.
D— A leaning effect on engines which use non-automatic carburetors.

7094. (1) Preignition is caused by improper ignition timing.

(2) Detonation occurs when an area of the combustion chamber becomes incandescent and ignites the fuel/air mixture in advance of normal timed ignition.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7095. Which of the following engine servicing operations generally requires engine pre-oiling prior to starting the engine?

A— Oil filter change.
B— Engine oil change.
C— Engine installation.
D— Replacement of oil lines.

7096. During the inspection of an engine control system in which push-pull control rods are used, the threaded rod ends should

A— not be adjusted in length for rigging purposes because the rod ends have been properly positioned and staked during manufacture.
B— be checked to determine that they are properly safetied to the push-pull rod with brass or stainless steel safety wire.
C— be checked for thread engagement of at least one and one-half threads but not more than three threads.
D— be checked for the amount of thread engagement by means of the inspection holes provided.

7097. Which of the following conditions would most likely lead to detonation?

A— Improper ignition timing.
B— Improper valve grinding at overhaul.
C— Use of fuel with too high an octane rating.
D— Use of fuel with too low an octane rating.

7098. The manifold pressure of an unsupercharged engine, operated at full throttle at sea level, will be less than sea-level pressure. At altitude, providing the RPM is unchanged, the

A— engine will lose power due to the reduced volume of air drawn into the cylinders.
B— power produced by the engine will remain unchanged.
C— power produced by the engine will increase slightly due to the reduced exhaust back pressure.
D— engine will lose power due to the reduced density of the air drawn into the cylinders.

7099. Which of the following would most likely cause a reciprocating engine to backfire through the induction system at low RPM operation?

A— Idle speed too low.
B— Idle mixture too rich.
C— Clogged derichment valve.
D— Lean mixture.

7100. How may it be determined that a reciprocating engine with a dry sump is pre-oiled sufficiently?

A— Oil will appear on the cylinder interior walls.
B— The engine oil pressure gauge will indicate normal oil pressure.
C— Oil will flow from the engine return line or indicator port.
D— When the quantity of oil specified by the manufacturer has been pumped into the engine.

7101. What is the basic operational sequence for reducing the power output of an engine equipped with a constant-speed propeller?

A— Reduce the RPM, then the manifold pressure.
B— Reduce the RPM, then adjust the propeller control.
C— Reduce the manifold pressure, then retard the throttle to obtain the correct RPM.
D— Reduce the manifold pressure, then the RPM.

7102. Which statement pertaining to fuel/air ratios is true?

A— The mixture ratio which gives the best power is richer than the mixture ratio which gives maximum economy.
B— A lean mixture is faster burning than a normal mixture.
C— A rich mixture is faster burning than a normal mixture.
D— The mixture ratio which gives maximum economy may also be designated as best power mixture.

7103. Backfiring through the carburetor generally results from the use of

A— excessive manifold pressure.
B— an excessively lean mixture.
C— excessively atomized fuel.
D— an excessively rich mixture.

7104. Which of these conditions will cause an engine to have an increased tendency to detonate?

1. High manifold pressure.
2. High intake air temperature.
3. Engine overheated.
4. Late ignition timing.

A— 1, 4.
B— 3, 4.
C— 1, 2, 3.
D— 1, 2, 3, 4.

7105. When will small induction system air leaks have the most noticeable effect on engine operation?

A— At medium to high cruise power settings.
B— At high RPM.
C— At maximum continuous and takeoff power settings.
D— At low RPM.

7106. To reduce the power output of an engine equipped with a constant-speed propeller and operating near maximum BMEP, the

A— manifold pressure is reduced with the throttle control before the RPM is reduced with the propeller control.
B— manifold pressure is reduced with the propeller control before the RPM is reduced with the throttle control.
C— RPM is reduced with the throttle control before the manifold pressure is reduced with the propeller control.
D— RPM is reduced with the propeller control before the manifold pressure is reduced with the throttle control.

7107. One of the best indicators of reciprocating engine combustion chamber problems is

A— excessive engine vibration.
B— low oil pressure.
C— carburetor condition.
D— spark plug condition.

7108. What could cause excessive pressure buildup in the crankcase of a reciprocating engine?

A— Plugged crankcase breather.
B— Oil pump pressure adjusted too high.
C— An excessive quantity of oil.
D— Worn oil scavenger pump.

7109. Excessive valve clearance in a piston engine

A— increases valve overlap.
B— has no effect on valve overlap.
C— increases valve service life.
D— decreases valve overlap.

7110. The critical altitude is the highest altitude at which an engine will maintain, at the maximum continuous rotational speed, maximum

A— continuous horsepower.
B— peak horsepower.
C— indicated horsepower.
D— cruise horsepower.

7111. If air is heard coming from the crankcase breather or oil filler during a differential compression check, what is this an indication of?

A— Exhaust valve leakage.
B— Intake valve leakage.
C— Piston ring leakage.
D— The piston is not on the compression stroke.

7112. One cause of afterfiring in an aircraft engine is

A— early timing.
B— sticking intake valves.
C— an excessively lean mixture.
D— an excessively rich mixture.

7113. At what point in an axial-flow turbojet engine will the highest gas pressures occur?

A— Immediately after the turbine section.
B— At the turbine entrance.
C— Within the burner section.
D— At the compressor outlet.

7114. Identify a function of the nozzle diaphragm in a turbojet engine.

A— To decrease the velocity of exhaust gases.
B— To center the fuel spray in the combustion chamber.
C— To direct the flow of gases to strike the turbine buckets at a desired angle.
D— To direct the flow of gases into the combustion chamber.

7115. What is the profile of a turbine engine compressor blade?

A— The shape of the blade root at the disk attachment.
B— The leading edge of the blade.
C— A cutout that reduces blade tip thickness.
D— The curvature of the blade root.

7116. The fan rotational speed of a dual axial compressor forward fan engine is the same as the

A— accessory drive shaft.
B— low-pressure compressor.
C— forward turbine wheel.
D— high-pressure compressor.

7117. The abbreviation "P" with subscript t7 used in turbine engine terminology means

A— the total inlet pressure.
B— pressure and temperature at station No. 7.
C— seven times the temperature divided by the total pressure.
D— the total pressure at station No. 7.

7118. The blending of blades and vanes in a turbine engine

A— is usually accomplished only at engine overhaul.
B— should be performed parallel to the length of the blade using smooth contours to minimize stress points.
C— should be performed perpendicular to the length of the blade using sharp contours to minimize stress points.
D— may sometimes be accomplished with the engine installed, ordinarily using power tools.

7119. What turbine engine section provides for proper mixing of the fuel and air?

A— Combustion section.
B— Compressor section.
C— Turbine section.
D— Accessory section.

7120. In a gas turbine engine, combustion occurs at a constant

A— volume.
B— pressure.
C— velocity.
D— density.

7121. Which statement is true regarding jet engines?

A— At the lower engine speeds, thrust increases rapidly with small increases in RPM.
B— At the higher engine speeds, thrust increases rapidly with small increases in RPM.
C— Gas turbine engines operate less efficiently at high altitudes due to the lower temperatures encountered.
D— The thrust delivered per pound of air consumed is less at high altitude than at low altitude.

7122. Some high-volume turboprop and turbojet engines are equipped with two-spool or split compressors. When these engines are operated at high altitudes, the

A— throttle must be retarded to prevent overspeeding of the two compressor rotors due to the lower density air.
B— low-pressure rotor will increase in speed as the compressor load decreases in the lower density air.
C— throttle must be retarded to prevent overspeeding of the high-pressure rotor due to the lower density air.
D— low-pressure rotor will decrease in speed as the compressor load decreases in the lower density air.

7123. Gas turbine engines use a nozzle diaphragm which is located on the upstream side of the turbine wheel. One of the functions of this unit is to

A— decrease the velocity of the heated gases flowing past this point.
B— direct the flow of gases parallel to the vertical line of the turbine buckets.
C— increase the velocity of the heated gases flowing past this point.
D— increase the pressure of the exhaust mass.

7124. Where is the highest gas pressure in a turbojet engine?

A— At the outlet of the tailpipe section.
B— At the entrance of the turbine section.
C— In the entrance of the burner section.
D— In the outlet of the burner section.

7125. An exhaust cone placed aft of the turbine in a jet engine will cause the pressure to

A— increase and the velocity to decrease.
B— increase and the velocity to increase.
C— decrease and the velocity to increase.
D— decrease and the velocity to decrease.

7126. What is the function of the stator vane assembly at the discharge end of a typical axial-flow compressor?

A— To reduce drag on the first stage turbine blades.
B— To straighten airflow to eliminate turbulence.
C— To direct the flow of gases into the combustion chambers.
D— To increase air swirling motion into the combustion chambers.

7127. The turbines near the rear of a jet engine

A— compress air heated in the combustion section.
B— increase air velocity for propulsion.
C— circulate air to cool the engine.
D— drive the compressor section.

7128. When starting a turbine engine,

A— a hot start is indicated if the exhaust gas temperature exceeds specified limits.
B— an excessively lean mixture is likely to cause a hot start.
C— the engine should start between 60 to 80 seconds after the fuel shutoff lever is opened.
D— release the starter switch as soon as indication of light-off occurs.

7129. In the dual axial-flow or twin spool compressor system, the first stage turbine drives the

A— N_1 and N_2 compressors.
B— N_3 compressor.
C— N_2 compressor.
D— N_1 compressor.

7130. Cracks may occur in hot section components of a turbine engine if they are marked during inspection with

A— a lead pencil.
B— chalk.
C— layout dye.
D— any of the above.

7131. When starting a turbine engine, a hung start is indicated if the engine

A— exhaust gas temperature exceeds specified limits.
B— fails to reach idle RPM.
C— RPM exceeds specified operating speed.
D— pressure ratio exceeds specified operating limits.

7132. What are the two main sections of a turbine engine for inspection purposes?

A— Combustion and exhaust.
B— Hot and cold.
C— Compressor and turbine.
D— Combustion and turbine.

7133. What are the two basic elements of the turbine section in a turbine engine?

A— Impeller and diffuser.
B— Compressor and manifold.
C— Bucket and expander.
D— Stator and rotor.

7134. The function of the exhaust cone assembly of a turbine engine is to

A— collect the exhaust gases and act as a noise suppressor.
B— pipe the exhaust gases away from the aircraft.
C— swirl and collect the exhaust gases into a single exhaust jet.
D— straighten and collect the exhaust gases into a solid exhaust jet.

7135. What are the two functional elements in a centrifugal compressor?

A— Turbine and compressor.
B— Compressor and manifold.
C— Bucket and expander.
D— Impeller and diffuser.

7136. What must be done after the fuel control unit has been replaced on a turbine engine?

A— Retime the engine.
B— Recalibrate the fuel nozzles.
C— Retrim the engine.
D— Recheck the flame pattern.

7137. What is the most satisfactory method of attaching turbine blades to turbine wheels?

A— The fir-tree design.
B— The tongue and groove design.
C— High temp-high strength adhesive method.
D— Press fit method.

7138. A turbine engine compressor which contains vanes on both sides of the impeller is a

A— single entry centrifugal compressor.
B— double entry centrifugal compressor.
C— double entry axial-flow compressor.
D— single entry axial-flow compressor.

7139. What is the first engine instrument indication of a successful start of a turbine engine?

A— A decrease in the exhaust gas temperature.
B— A rise in the engine fuel flow.
C— A decrease in the engine pressure ratio.
D— A rise in the exhaust gas temperature.

7140. Turbine discharge pressure is identified in service manuals and by engine instruments as

A— Pt7.
B— Pt2.
C— Tt2.
D— Tt7.

7141. Who establishes the recommended operating time between overhauls (TBO) of a turbine engine used in general aviation?

A— The engine manufacturer.
B— The operator working in conjunction with the FAA.
C— The owner/operator.
D— The FAA.

7142. The basic gas turbine engine is divided into two main sections: the cold section and the hot section.

(1) The cold section includes the engine inlet, compressor, and turbine sections.

(2) The hot section includes the combustor, diffuser, and exhaust sections.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7143. (1) Gas welding and straightening of turbine engine rotating airfoils does not require special equipment.

(2) Gas welding and straightening of turbine engine rotating airfoils is quite often recommended by the manufacturer.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7144. A type of repair to turbine engine compressor blade coded areas is accomplished by a procedure termed blending.

(1) Blending is a hand method of recontouring damaged blades and vanes.

(2) Blending requires the use of small files, emery cloth, and honing stones.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7145. Who establishes the recommended operating time between overhauls (TBO) of a turbine engine used in air carrier operation?

A— The engine manufacturer.
B— The operator working in conjunction with the FAA.
C— The owner/operator.
D— The FAA.

7146. Who establishes mandatory replacement times for critical components of turbine engines?

A— The owner/operator.
B— The FAA.
C— The operator working in conjunction with the FAA.
D— The engine manufacturer.

7147. Main bearing oil seals used with turbine engines are usually what type(s)?

A— Labyrinth and/or carbon rubbing.
B— Silicone rubber and nylon.
C— Teflon and synthetic rubber.
D— Labyrinth and/or silicone rubber.

7148. How does a dual axial-flow compressor improve the efficiency of a turbojet engine?

A— More turbine wheels can be used.
B— Combustion chamber temperatures are reduced.
C— Higher compression ratios can be obtained.
D— The velocity of the air entering the combustion chamber is increased.

7149. Three types of turbine blades are

A— reaction, converging, and diverging.
B— impulse, reaction, and impulse-reaction.
C— tangential, reaction, and reaction-tangential.
D— impulse, vector, and impulse-vector.

7150. A turboprop powerplant propeller

A— is governed at the same speed as the turbine.
B— controls the speed of the engine in the beta range.
C— accounts for 75 to 85 percent of the total thrust output.
D— accounts for 15 to 25 percent of the total thrust output.

7151. An advantage of the axial-flow compressor is its

A— low starting power requirements.
B— low weight.
C— high peak efficiency.
D— high frontal area.

7152. What is the purpose of the stator blades in the compressor section of a turbine engine?

A— Stabilize pressure.
B— Prevent compressor surge.
C— Control direction of the airflow.
D— Increase velocity of the airflow.

7153. What is the purpose of the diffuser section in a turbine engine?

A— To increase pressure and reduce velocity.
B— To speed up the airflow in the turbine section.
C— To convert pressure to velocity.
D— To reduce pressure and increase velocity.

7154. Where do stress rupture cracks usually appear on turbine blades of turbojet engines?

A— Across the blade root, parallel to the fir tree.
B— Along the trailing edge, parallel to the edge.
C— Along the leading edge, parallel to the edge.
D— Across the leading or trailing edge at a right angle to the edge length.

7155. In which type of turbine engine combustion chamber is the case and liner removed and installed as one unit during routine maintenance?

A— Can.
B— Can annular.
C— Variable.
D— Annular.

7156. The diffuser section of a jet aircraft engine is located between

A— the burner section and the turbine section.
B— the N_1 section and the N_2 section.
C— station No. 7 and station No. 8.
D— the compressor section and the burner section.

7157. Which of the following are the most common types of thrust reversers used on turbine-engine-powered aircraft?

A— Convergent and divergent.
B— Rotary air vane and stationary air vane.
C— Mechanical blockage and aerodynamic blockage.
D— Cascade vane and blocked door.

7158. When the leading edge of a first-stage turbine blade is found to have stress rupture cracks, which of the following should be suspected?

A— Air seal wear.
B— Faulty cooling shield.
C— Overtemperature condition.
D— Overspeed condition.

7159. Damage to turbine vanes is apt to be greater than damage to compressor vanes because turbine vanes are subjected to much greater

A— stress in the combustor.
B— heat stress.
C— thrust clearance.
D— vibration and other stresses.

7160. Which of the following is the ultimate limiting factor of turbine engine operation?

A— Compressor inlet air temperature.
B— Compressor outlet air temperature.
C— Turbine inlet temperature.
D— Burner-can pressure.

7161. How is the turbine shaft usually joined to the compressor rotor of a centrifugal compressor turbine engine?

A— Bolted coupling.
B— Keyed coupling.
C— Welded coupling.
D— Splined coupling.

7162. Which of the following engine variables is the most critical during turbine engine operation?

A— Compressor inlet air temperature.
B— Compressor RPM.
C— Burner-can pressure.
D— Turbine inlet temperature.

7163. Reduced blade vibration and improved airflow characteristics in gas turbines are brought about by

A— fir-tree blade attachment.
B— impulse type blades.
C— shrouded turbine rotor blades.
D— bulb root attachment.

7164. Which turbine engine compressor offers the greatest advantages for both starting flexibility and improved high-altitude performance?

A— Single-stage, centrifugal-flow.
B— Dual-stage, centrifugal-flow.
C— Split-spool, axial-flow.
D— Single-spool, axial-flow.

7165. Jet engine turbine blades removed for detailed inspection must be re-installed in

A— a slot 180° away.
B— a slot 90° clockwise.
C— a slot 90° counterclockwise.
D— the same slot.

7166. An advantage of the centrifugal-flow compressor is its high

A— frontal area.
B— pressure rise per stage.
C— ram efficiency.
D— peak efficiency.

7167. The highest heat-to-metal contact in a jet engine is the

A— burner cans.
B— exhaust cone.
C— turbine inlet guide vanes.
D— turbine blades.

7168. Which two elements make up the axial-flow compressor assembly?

A— Rotor and stator.
B— Rotor and diffuser.
C— Compressor and manifold.
D— Stator and diffuser.

7169. The two types of centrifugal compressor impellers are

A— single stage and two stage.
B— single entry and double entry.
C— rotor and stator.
D— impeller and diffuser.

7170. Between each row of rotating blades in a turbine engine compressor, there is a row of stationary blades which act to diffuse the air. These stationary blades are called

A— buckets.
B— expanders.
C— diffuser blades.
D— stators.

7171. Standard sea level pressure is

A— 30.92" Hg.
B— 32.174" Hg.
C— 56.2" Hg.
D— 29.92" Hg.

7172. Using standard atmospheric conditions, the standard sea level temperature is

A— 59 °F.
B— 59 °C.
C— 29 °C.
D— 15 °F.

7173. When aircraft turbine blades are subjected to excessive temperatures, what type of failures would you expect?

A— Compression and torsion.
B— Bending and torsion.
C— Torsion and tension.
D— Stress rupture.

7174. In an axial-flow compressor, one purpose of the stator vanes at the discharge end of the compressor is to

A— prevent compressor surge and eliminate stalls.
B— straighten the airflow and eliminate turbulence.
C— increase the velocity and prevent swirling and eddying.
D— decrease the velocity, prevent swirling, and decrease pressure.

7175. Compressor field cleaning on turbine engines is performed primarily in order to

A— prevent engine oil contamination and subsequent engine bearing wear or damage.
B— facilitate flight line inspection of engine inlet and compressor areas for defects or FOD.
C— obtain accurate spectrometric oil analysis readings.
D— prevent engine performance degradation, increased fuel costs, and damage or corrosion to gas path surfaces.

7176. The two types of compressors most commonly used in jet engines are

A— axial and root.
B— centrifugal and reciprocating.
C— root and centrifugal.
D— centrifugal and axial.

7177. A purpose of the shrouds on the turbine blades of an axial-flow engine is to

A— reduce vibration.
B— shorten run-in time.
C— increase tip speed.
D— reduce air entrance.

7178. In a dual axial-flow compressor, the first stage turbine drives

A— N_2 compressor.
B— N_1 compressor.
C— low pressure compressor.
D— both low and high pressure compressors.

7179. What should be done if a turbine engine catches fire during starting?

A— Turn off the fuel and continue cranking.
B— Disengage starter immediately.
C— Continue starting attempt to blow out fire.
D— Place power lever in increase to exhaust fuel fumes.

7180. What is the proper starting sequence for a turbojet engine?

A— Ignition, starter, fuel.
B— Fuel, starter, ignition.
C— Starter, ignition, fuel.
D— Starter, fuel, ignition.

7181. In-flight turbine engine flameouts are usually caused by

A— high exhaust gas temperature.
B— interruption of the inlet airflow.
C— fouling of the primary igniter plugs.
D— fuel-nozzle clogging.

7182. What is used in turbine engines to aid in stabilization of compressor airflow during low thrust engine operation?

A— Stator vanes and rotor vanes.
B— Variable guide vanes and/or compressor bleed valves.
C— Pressurization and dump valves.
D— Variable geometry inlet ducts.

7183. In a turbine engine with a dual-spool compressor, the low speed compressor

A— always turns at the same speed as the high speed compressor.
B— is connected directly to the high speed compressor.
C— seeks its own best operating speed.
D— has a higher compressor shaft speed than the high speed compressor.

7184. What is the function of the inlet guide vane assembly on an axial-flow compressor?

A— Directs the air into the first stage rotor blades at the proper angle.
B— Converts velocity energy into pressure energy.
C— Converts pressure energy into velocity energy.
D— Picks up air and adds energy as it accelerates outward by centrifugal force.

7185. Hot spots on the tail cone of a turbine engine are possible indicators of a malfunctioning fuel nozzle or

A— a faulty combustion chamber.
B— a loose inlet air guide vane.
C— a faulty igniter plug.
D— an improperly positioned tail cone.

7186. The stator vanes in an axial-flow compressor

A— convert velocity energy into pressure energy.
B— convert pressure energy into velocity energy.
C— direct air into the first stage rotor vanes at the proper angle.
D— pick up air and add energy as it accelerates outward by centrifugal force.

7187. What happens to velocity as subsonic air flows through a convergent nozzle?

A— Increases.
B— Decreases.
C— Remains constant.
D— Is inversely proportional to the temperature.

7188. What happens to velocity as supersonic air flows through a divergent nozzle?

A— Increases.
B— Decreases.
C— Remains constant.
D— Is inversely proportional to the temperature.

7189. What happens to pressure as subsonic air flows through a convergent nozzle?

A— Increases.
B— Decreases.
C— Remains constant.
D— Is inversely proportional to the temperature.

7190. What happens to pressure as supersonic air flows through a divergent nozzle?

A— Increases.
B— Decreases.
C— Remains constant.
D— Is inversely proportional to the temperature.

7191. Anti-icing of turbojet engine air inlets is accomplished by

A— electrical heating elements inside the inlet guide vanes.
B— hot air ducted over the outside of the inlet guide vanes.
C— engine bleed air ducted through the critical areas.
D— electrical heating elements located within the engine air inlet cowling.

7192. Generally, when starting a turbine engine, the starter should be disengaged

A— when the engine lights are off.
B— after the engine has reached self-accelerating speed.
C— only after the engine has reached full idle RPM.
D— when the ignition and fuel system are activated.

7193. What is the primary advantage of an axial-flow compressor over a centrifugal compressor?

A— Easier maintenance.
B— High frontal area.
C— Less expensive.
D— Greater pressure ratio.

7194. What is the purpose of blow-in doors in the induction system of a turbine engine aircraft?

A— Admit air to the engine compartment during ground operation when the engine air requirements are in excess of the amount the normal intake system can supply.
B— Fire extinguisher access openings.
C— Admit air to the engine compartment during flight when the aircraft attitude is not conducive for ram air effect.
D— Access openings for inspection of compressor and turbine blades.

7195. What is meant by a double entry centrifugal compressor?

A— A compressor that has two intakes.
B— A two-stage compressor independently connected to the main shaft.
C— Two compressors and two impellers.
D— A compressor with vanes on both sides of the impeller.

7196. What is the major function of the turbine assembly in a turbojet engine?

A— Compresses the air before it enters the combustion section.
B— Directs the gases in the proper direction to the tailpipe.
C— Supplies the power to turn the compressor.
D— Increases the temperature of the exhaust gases.

7197. Stator blades in the compressor section of an axial-flow turbine engine

A— increase the air velocity and prevent swirling.
B— straighten the airflow and accelerate it.
C— decrease the air velocity and prevent swirling.
D— prevent compressor surge.

7198. A gas turbine engine comprises which three main sections?

A— Compressor, diffuser, and scavenge.
B— Turbine, combustion, and scavenge.
C— Combustion, compressor, and inlet guide vane.
D— Compressor, combustion, and turbine.

7199. What type of turbine blade is most commonly used in aircraft jet engines?

A— Reaction.
B— Divergent.
C— Impulse.
D— Reaction-impulse (or impulse-reaction).

7200. What is the primary factor which controls the pressure ratio of an axial-flow compressor?

A— Number of stages in compressor.
B— Rotor diameter.
C— Compressor inlet pressure.
D— Compressor inlet temperature.

7201. (1) A turbine engine axial-flow compressor is made up of a series of rotating airfoils called rotor blades and a stationary set of airfoils called stator vanes.

(2) In a turbine engine, a row of rotating and stationary blades is called a stage.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7202. (1) In a turbine engine axial-flow compressor, each consecutive pair of rotor and stator blades constitutes a pressure stage.

(2) In a turbine engine axial-flow compressor, the number of rows of stages is determined by the amount of air and total pressure rise required.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7203. The air passing through the combustion chamber of a jet engine is

A— used to support combustion and to cool the engine.
B— entirely combined with fuel and burned.
C— speeded up and heated by the action of the turbines.
D— circulated in the combustion chamber until consumed.

7204. The stators in the turbine section of a gas turbine engine

A— increase the velocity of the air.
B— decrease the velocity of the air.
C— increase the pressure of the air.
D— are located behind the rotor.

7205. The compressor stators in a gas turbine engine act as diffusers to

A— decrease the velocity of the gas flow.
B— increase the velocity of the gas flow.
C— decrease the pressure of the gas.
D— increase the velocity and decrease the pressure of the gas.

7206. The procedure for removing the accumulation of dirt deposits on compressor blades is called

A— the soak method.
B— field cleaning.
C— the purging process.
D— reversed cleaning.

7207. Which of the following is used to accomplish internal inspection of installed turbine engines?

1. Infrared photography.
2. Ultrasound.
3. A borescope.
4. Fluorescent penetrant and ultraviolet light.

A— 1, 2, 3.
B— 1, 3.
C— 3.
D— 4.

7208. What is the possible cause when a turbojet engine indicates no change in power setting parameters, but oil temperature is high?

A— Unusual scavenge pump oil flow.
B— Engine main bearing distress.
C— Gearbox seal leakage.
D— High oil sump pressure.

7209. Which of the following is NOT a factor in the operation of an automatic fuel control unit used on turbojet engines?

A— Compressor inlet air density.
B— Compressor RPM.
C— Mixture control position.
D— Throttle position.

7210. Newton's First Law of Motion, generally termed the Law of Inertia, states:

A— To every action there is an equal and opposite reaction.
B— Force is proportional to the product of mass and acceleration.
C— Every body persists in its state of rest, or of motion in a straight line, unless acted upon by some outside force.
D— Force applied to an object at any point is transmitted in every direction without loss.

7211. A turbine engine hot section is particularly susceptible to which kind of damage?

A— Scoring.
B— Pitting.
C— Cracking.
D— Galling.

7212. Dirt particles in the air being introduced into the compressor of a turbine engine will form a coating on all but which of the following?

A— Turbine blades.
B— Compressor blades.
C— Casings.
D— Inlet guide vanes.

7213. Severe rubbing of turbine engine compressor blades will usually cause

A— bowing.
B— cracking.
C— burning.
D— galling.

7214. Which of the following influences the operation of an automatic fuel control unit on a turbojet engine?

A— Fuel temperature.
B— Burner pressure.
C— Mixture control position.
D— Exhaust gas temperature.

7215. If a turbine engine is unable to reach takeoff EPR before its EGT limit is reached, this is an indication that the

A— fuel control must be replaced.
B— EGT controller is out of adjustment.
C— ambient temperature is above 100 °F.
D— compressor may be contaminated or damaged.

7216. The Brayton cycle is known as the constant

A— pressure cycle.
B— volume cycle.
C— temperature cycle.
D— mass cycle.

7217. Where is water injected into a turbojet engine for cooling purposes?

A— Compressor air inlet or diffuser.
B— Second-stage compressor or turbine.
C— Burner can.
D— Fuel control.

7218. Continued and/or excessive heat and centrifugal force on turbine engine rotor blades is likely to cause

A— profile.
B— creep.
C— surge.
D— galling.

7219. If the RPM of an axial-flow compressor remains constant, the angle of attack of the rotor blades can be changed by

A— changing the velocity of the airflow.
B— changing the compressor diameter.
C— increasing the pressure ratio.
D— decreasing the pressure ratio.

7220. The compression ratio of an axial-flow compressor is a function of the

A— number of compressor stages.
B— rotor diameter.
C— diffuser area.
D— air inlet velocity.

7221. Which of the following variables affect the inlet air density of a turbine engine?

1. Speed of the aircraft.
2. Compression ratio.
3. Turbine inlet temperature.
4. Altitude of the aircraft.
5. Ambient temperature.
6. Turbine and compressor efficiency.

A— 1, 3, 6.
B— 1, 4, 5.
C— 4, 5, 6.
D— 2, 3, 4.

7222. Which of the following factors affect the thermal efficiency of a turbine engine?

1. Turbine inlet temperature.
2. Compression ratio.
3. Ambient temperature.
4. Speed of the aircraft.
5. Turbine and compressor efficiency.
6. Altitude of the aircraft.

A— 3, 4, 6.
B— 3, 4, 5.
C— 1, 2, 5.
D— 1, 2, 6.

7223. Why do some turbine engines have more than one turbine wheel attached to a single shaft?

A— To facilitate balancing of the turbine assembly.
B— To straighten the airflow before it enters the exhaust area.
C— To help stabilize the pressure between the compressor and the turbine.
D— To extract more power from the exhaust gases than a single wheel can absorb.

7224. The exhaust section of a turbine engine is designed to

A— impart a high exit velocity to the exhaust gases.
B— swirl the exhaust gases.
C— increase temperature, therefore increasing velocity.
D— decrease temperature, therefore decreasing pressure.

7225. Which of the following types of combustion sections are used in aircraft turbine engines?

A— Variable, can-annular, and cascade vane.
B— Annular, variable, and cascade vane.
C— Can, multiple-can, and variable.
D— Multiple-can, annular, and can-annular.

7226. Why does a turbine engine require a cool-off period before shutting it down?

A— To allow the surfaces contacted by the lubricating oil to return to normal operating temperature.
B— To burn off excess fuel ahead of the fuel control.
C— To allow the turbine wheel to cool before the case contracts around it.
D— To avoid seizure of the engine bearings.

7227. How many igniters are normally used on a turbine engine having nine burner cans?

A— One.
B— Two.
C— Three.
D— Nine.

7228. What is meant by a shrouded turbine?

A— The turbine blades are shaped so that their ends form a band or shroud.
B— Each turbine wheel is enclosed by a separate housing or shroud.
C— The turbine wheel is enclosed by a protective shroud to contain the blades in case of failure.
D— The turbine wheel has a shroud or duct which provides cooling air to the turbine blades.

7229. What term is used to describe a permanent and cumulative deformation of the turbine blades of a turbojet engine?

A— Stretch.
B— Elongation.
C— Distortion.
D— Creep.

7230. What is the purpose of the pressurization and dump valve used on turbojet engines?

A— Controls the pressure of the compressor outlet by dumping air when pressure reaches an established level.
B— Allows fuel pressurization of the engine when starting and operating and dumps fuel pressure at engine shutdown.
C— Controls compressor stall by dumping compressor air under certain conditions.
D— Maintains fuel pressure to the fuel control valve and dumps excessive fuel back to the fuel tanks.

7231. At what stage in a turbojet engine are pressures the greatest?

A— Compressor inlet.
B— Turbine outlet.
C— Compressor outlet.
D— Tailpipe.

7232. In what section of a turbojet engine is the jet nozzle located?

A— Combustion.
B— Turbine.
C— Compressor.
D— Exhaust.

7233. When a turbojet engine is removed for maintenance or test cell operation, it should be accomplished

A— under the supervision of FAA personnel.
B— in accordance with the manufacturer's instructions.
C— by the aircraft owner or operator.
D— by any FAA certificated repair station.

7234. (1) Accumulation of contaminates in the compressor of a turbojet engine reduces aerodynamic efficiency of the blades.

(2) Two common methods for removing dirt deposits from turbojet engine compressor blades are a fluid wash and an abrasive grit blast.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7235. Hot spots in the combustion section of a turbojet engine are possible indicators of

A— foreign object damage.
B— faulty igniter plugs.
C— dirty compressor blades.
D— malfunctioning fuel nozzles.

7236. Which of the following can cause fan blade shingling in a turbofan engine?

1. Engine overspeed.
2. Engine overtemperature.
3. Large, rapid throttle movements.
4. FOD.

A— 1.
B— 1, 2.
C— 1, 2, 3, 4.
D— 1, 4.

7237. Compressor stall is caused by

A— a low angle of attack airflow through the first stages of compression.
B— a high angle of attack airflow through the first stages of compression.
C— a high velocity airflow in the engine inlet.
D— rapid engine deceleration.

7238. A condition known as "hot streaking" in turbine engines is caused by

A— a partially clogged fuel nozzle.
B— a misaligned combustion liner.
C— uneven burner can cooling.
D— excessive fuel flow.

7239. Determine which portion of the AD is applicable for Model O-690 series engine, serial No. 5863-40 with 283 hours time in service.

This is the compliance portion of an FAA Airworthiness Directive.

Compliance required as indicated:

(A) For Model O-690 series engines, serial Nos. 101-40 through 5264-40 and IO-690 series engines, serial Nos. 101-48 through 423-48, compliance with (C) required within 25 hours time in service after the effective date of this AD and every 100 hours time in service thereafter.

(B) For Model O-690 series engines, serial Nos. 5265-40 through 6129-40 and IO-690 series engines, serial Nos. 424-48 through 551-48, compliance with (C) required as follows:

(1) Within 25 hours time in service after the effective date of this AD and every 100 hours time in service thereafter for engines with more than 275 hours time in service on the effective date of this AD.

(2) Prior to the accumulation of 300 hours total time in service and every 100 hours time in service thereafter for engines with 275 hours or less time in service on the effective date of this AD.

(C) Inspect the oil pump drive shaft (P/N 67512) on applicable engines in accordance with instructions contained in Connin Service Bulletin No. 295. Any shafts which are found to be damaged shall be replaced before further flight. These inspections shall be continued until Connin P/N 67512 (redesigned) or P/N 74641 oil pump drive shaft is installed at which time the inspections may be discontinued.

A— (B), (1).
B— (A).
C— (B), (2).
D— (A), (B), (C).

7240. A Cessna 180 aircraft has a McCauley propeller Model No. 2A34C50/90A. The propeller is severely damaged in a ground accident, and this model propeller is not available for replacement. Which of the following should be used to find an approved alternate replacement?

A— Summary of Supplemental Type Certificates.
B— Approved aircraft equipment list.
C— Aircraft Specifications/Type Certificate Data Sheets.
D— Aircraft Engine and Propeller Specifications/ Type Certificate Data Sheets.

7241. Which of the following is used to monitor the mechanical integrity of the turbines, as well as to check engine operating conditions of a turbine engine?

A— Engine oil pressure.
B— Exhaust gas temperature.
C— Engine oil temperature.
D— Engine pressure ratio.

7242. The exhaust system on aircraft using a jacket around the engine exhaust as a source of heat should be

A— visually inspected frequently and operational carbon monoxide detection tests performed periodically.
B— replaced at each engine overhaul.
C— replaced at each 100-hour inspection.
D— removed periodically and checked by magnetic particle inspection.

7243. (1) Airworthiness Directives are Federal Aviation Regulations and must be complied with unless specific exemption is granted.

(2) Most Airworthiness Directives of an emergency nature require immediate compliance upon receipt.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— neither No. 1 nor No. 2 is true.
D— both No. 1 and No. 2 are true.

7244. Which of the following contains a minimum checklist for 100-hour inspections of engines?

A— FAR Part 91.
B— FAR Part 65.
C— FAR Part 43.
D— Engine Specifications and Type Certificate Data Sheets.

7245. When must an engine Airworthiness Directive (AD) be complied with after it becomes effective?

A— As specified in the AD.
B— During the next scheduled inspection.
C— At the next scheduled overhaul.
D— Within 30 calendar days.

7246. Which of the following contains a table that lists the engines to which a given propeller is adaptable?

A— Aircraft Type Certificate Data Sheets.
B— Technical Standard Order Authorization.
C— Propeller Type Certificate Data Sheets.
D— Engine Type Certificate Data Sheets.

7247. Which of the following component inspections is to be accomplished on a 100-hour inspection?

A— Check internal timing of magneto.
B— Check cylinder compression.
C— Check float level.
D— Check valve timing.

7248. You are performing a 100-hour inspection on an R985-22 aircraft engine. What does the "985" indicate?

A— The total piston displacement of the engine.
B— The pistons will pump a maximum of 985 cubic inches of air per crankshaft revolution.
C— The total volume of the pistons is 985 plus 22 cubic inches.
D— The total piston displacement of one cylinder.

7249. During a 100-hour inspection of an R1830-92 engine installed on a DC-3, a mechanic finds "CAA Spec 5E4" stamped on the data plate. Where would the meaning of this stamp be found?

A— The Aircraft Specification and Type Certificate Data Sheet.
B— Aircraft Listings.
C— Aircraft Engine Specifications.
D— Aircraft Engine Type Certificate Handbook.

7250. Straightening nitrided crankshafts is

A— recommended.
B— not recommended.
C— approved by repair stations.
D— approved by the manufacturer.

7251. The breaking loose of small pieces of metal from coated surfaces, usually caused by defective plating or excessive loads, is called

A— flaking.
B— chafing.
C— brinelling.
D— pitting.

7252. Each powerplant installed on an airplane with a Standard Airworthiness Certificate must have been

A— installed by the manufacturer.
B— type certificated.
C— manufactured under the TSO system.
D— originally certificated for that aircraft.

7253. A severe condition of chafing or fretting in which a transfer of metal from one part to another occurs is called

A— scoring.
B— burning.
C— erosion.
D— galling.

7254. Indentations on bearing races caused by high static loads are known as

A— fretting.
B— brinelling.
C— galling.
D— flaking.

7255. What document is used to determine if a particular engine conforms to its original type design?

A— Federal Aviation Regulations.
B— Engine Manufacturer's Maintenance Manual.
C— Aircraft Engine Specifications or Type Certificate Data Sheets.
D— Checklist in FAR Part 43, appendix D.

7256. Which of the following can inspect and approve an engine major repair for return to service?

A— Certificated mechanic with airframe and powerplant ratings.
B— Certificated mechanic with a powerplant rating.
C— Certificated mechanic with inspection authorization.
D— Designated Mechanic Examiner.

7257. What publication is used for guidance to determine whether a powerplant repair is major or minor?

A— Airworthiness Directives.
B— Federal Aviation Regulations, Part 43, appendix A.
C— Supplemental Type Certificates.
D— Technical Standard Orders.

7258. The airworthiness standards for the issue of type certificates for small airplanes with less than 10 passenger seats in the normal, utility, and acrobatic categories may be found in the

A— Technical Standard Orders.
B— Federal Aviation Regulations, Part 23.
C— FAA advisory circulars.
D— Minimum Equipment List (MEL) for the specific aircraft.

7259. Which of the following contains approved data for performing a major repair to an aircraft engine?

A— Engine Type Certificate Data Sheets.
B— Supplemental Type Certificates.
C— Technical Standard Orders.
D— Manufacturer's Maintenance Manual when FAA approved.

7260. What maintenance record(s) are required following a major repair of an aircraft engine?

A— Entries in the airplane flight manual and aircraft logbook.
B— Entries in engine maintenance records and a list of discrepancies for the FAA.
C— Entries in the engine maintenance record and FAA Form 337.
D— Entry in logbook.

7261. A ground incident that results in propeller sudden stoppage may require a crankshaft runout inspection. What publication would be used to obtain crankshaft runout tolerance?

A— Federal Aviation Regulations.
B— Current Manufacturer's Maintenance Manual or Instructions for Continued Airworthiness.
C— Type Certificate Data Sheet.
D— AC 43.13-1A, Acceptable Methods, Techniques, and Practices — Aircraft Inspection and Repair.

7262. Select the Airworthiness Directive applicability statement which applies to an IVO-355 engine, serial number T8164, with 2,100 hours total time and 300 hours since rebuilding.

A— Applies to all IVO-355 engines, serial numbers T8000 through T8300, having less than 2,400 hours total time.
B— Applies to all IVO-355 engines, serial numbers T8000 through T8900 with 2,400 hours or more total time.
C— Applies to all I.O. and TV10-355 engines, all serial numbers regardless of total time or since overhaul.
D— Applies to all IVO-355 engines, serial numbers T4000 through T7999 having more than 2,400 hours total time.

7263. What publication contains time or cycle limitations for components or parts of a turbine engine installed on a specific aircraft?

A— Instructions for continued airworthiness issued by the airplane manufacturer.
B— Federal Aviation Regulations, Part 33, Airworthiness Standards; Aircraft Engines.
C— Engine Manufacturer Parts Catalog.
D— AC 43.13-1A, Acceptable Methods, Techniques, and Practices — Aircraft Inspection and Repair.

7264. How are discharge nozzles in a fuel injected reciprocating engine identified to indicate the flow range?

A— By an identification letter stamped on one of the hexes of the nozzle body.
B— By drilled radial holes connecting the upper counterbore with the outside of the nozzle body.
C— By an identification metal tag attached to the nozzle body.
D— By color codes on the nozzle body.

7265. What section in the instructions for continued airworthiness is FAA approved?

A— Engine maintenance manual or section.
B— Engine overhaul manual or section.
C— Engine installation instructions.
D— Airworthiness limitations section.

7266. Which of the following conditions is usually not acceptable to any extent in turbine blades?

A— Cracks.
B— Nicks.
C— Pits.
D— Dents.

7267. (1) Serviceability limits for turbine blades are much more stringent than are those for turbine nozzle vanes.

(2) A limited number of small nicks and dents can usually be permitted in any area of a turbine blade.

Regarding the above statements,

A— both No. 1 and No. 2 are true.
B— neither No. 1 nor No. 2 is true.
C— only No. 1 is true.
D— only No. 2 is true.

7268. Which unit most accurately indicates fuel consumption of a reciprocating engine?

A— Fuel flowmeter.
B— BMEP indicator.
C— Fuel pressure gauge.
D— Electronic fuel quantity indicator.

7269. The type of fuel-flow instrument indicating system that is most used in large airplanes with reciprocating engines is

A— a direct reading system.
B— an ac synchro (autosyn) system.
C— a synchro resolver system.
D— a servomechanism system.

7270. The current required to operate an aircraft autosyn fuel-flow indicating system is

A— direct current.
B— pulsating current.
C— alternating current.
D— pulsating voltage.

7271. Motor driven impeller and turbine fuel flow transmitters are designed to transmit data

A— using aircraft electrical system power.
B— mechanically.
C— by fuel pressure.
D— using transmitter generated electrical power.

7272. The fuel-flow indicator rotor and needle for a motor-impeller and turbine indicating system is driven by

A— an electrical signal.
B— direct coupling to the motor shaft.
C— a friction clutch on the motor shaft.
D— a mechanical gear train.

7273. On a twin-engine aircraft with fuel-injected reciprocating engines, one fuel-flow indicator reads considerably higher than the other in all engine operating configurations. What is the probable cause of this indication?

A— Carburetor icing.
B— One or more fuel nozzles are clogged.
C— Excessive intake valve clearances.
D— Alternate air door stuck open.

7274. The fuel-flow indication system used with most fuel-injected opposed engine airplanes utilizes a measure of

A— fuel flow volume.
B— fuel pressure drop.
C— fuel flow mass.
D— fuel/air charge density.

7275. In addition to fuel quantity, a computerized fuel system (CFS) with a totalizer-indicator provides indication of how many of the following?

1. Fuel flow rate.
2. Fuel used since reset or initial start-up.
3. Fuel time remaining at current power setting.
4. Fuel temperature.

A— One.
B— Two.
C— Three.
D— Four.

7276. The fuel-flow indication data sent from motor driven impeller and turbine fuel flow transmitters is a measure of

A— fuel mass-flow.
B— fuel volume-flow.
C— engine burner pressure drop.
D— fuel viscosity-flow.

7277. In an aircraft equipped with a pressure-drop type fuel-flow indicating system, if one of the injector nozzles becomes restricted, this would cause

A— a decrease in fuel flow with a deceased fuel flow indication on the gauge.
B— a decrease in fuel flow with an increased fuel flow indication on the gauge.
C— a decrease in fuel flow with no change in fuel flow indication on the gauge.
D— an increase in fuel flow with a decreased fuel flow indication on the gauge.

7278. A manifold pressure gauge is designed to

A— maintain constant pressure in the intake manifold.
B— indicate differential pressure between the intake manifold and atmospheric pressure.
C— indicate variations of atmospheric pressure at different altitudes.
D— indicate absolute pressure in the intake manifold.

7279. The purpose of an exhaust gas analyzer is to indicate the

A— brake specific fuel consumption.
B— fuel/air ratio being burned in the cylinders.
C— temperature of the exhaust gases in the exhaust manifold.
D— grade of fuel being used.

7280. Which of the following types of electric motors are commonly used in electric tachometers?

A— Direct current, series-wound motors.
B— Synchronous motors.
C— Direct current, shunt-wound motors.
D— Direct current, compound-wound motors.

7281. Where are the hot and cold junctions located in an engine cylinder temperature indicating system?

A— Both junctions are located at the instrument.
B— Both junctions are located at the cylinder.
C— The hot junction is located at the cylinder and the cold junction is located at the instrument.
D— The cold junction is located at the cylinder and the hot junction is located at the instrument.

7282. Basically, the indicator of a tachometer system is responsive to change in

A— current flow.
B— voltage polarity.
C— frequency.
D— voltage.

7283. Which statement is correct concerning a thermocouple-type temperature indicating instrument system?

A— It is a balanced-type, variable resistor circuit.
B— It requires no external power source.
C— It usually contains a balancing circuit in the instrument case to prevent fluctuations of the system voltage from affecting the temperature reading.
D— It will not indicate a true reading if the system voltage varies beyond the range for which it is calibrated.

7284. Which statement is true regarding a thermocouple-type cylinder head temperature measuring system?

A— The resistance required for cylinder head temperature indicators is measured in farads.
B— The voltage output of a thermocouple system is determined by the temperature difference between the two ends of the thermocouple.
C— If a resistor is installed in a thermocouple lead, it is placed in the positive lead.
D— When the master switch is turned on, a thermocouple indicator will move off-scale to the low side.

7285. What basic meter is used to indicate cylinder head temperature in most aircraft?

A— Iron-vane meter.
B— Electrodynamometer.
C— Galvanometer.
D— Thermocouple-type meter.

7286. Which of the following is a primary engine instrument?

A— Tachometer.
B— Torque meter.
C— Fuel flowmeter.
D— Airspeed indicator.

7287. A complete break in the line between the manifold pressure gauge and the induction system will be indicated by the gauge registering

A— prevailing atmospheric pressure.
B— zero.
C— higher than normal for conditions prevailing.
D— lower than normal for conditions prevailing.

7288. Engine oil temperature gauges indicate the temperature of the oil

A— entering the oil cooler.
B— entering the engine.
C— in the oil storage tank.
D— in the return lines to the oil storage tank.

7289. Why do helicopters require a minimum of two synchronous tachometer systems?

A— One indicates engine RPM and the other tail rotor RPM.
B— One indicates main rotor RPM and the other tail rotor RPM.
C— One indicates engine RPM and the other main rotor RPM.
D— Only helicopters with turbine engines employing a dual compressor require two systems.

7290. If the thermocouple leads were inadvertently crossed at installation, what would the cylinder temperature gauge pointer indicate?

A— Normal temperature for prevailing condition.
B— Oscillating pointer.
C— Moves off-scale on the zero side of the meter.
D— Moves off-scale on the high side of the meter.

7291. A common type of electrically operated oil temperature gauge utilizes

A— either a wheatstone bridge or ratiometer circuit.
B— a standing wave ratio (SWR) circuit.
C— a thermocouple type circuit.
D— vapor pressure and pressure switches.

7292. The indication on a thermocouple-type cylinder head temperature indicator is produced by

A— resistance changes in two dissimilar metals.
B— a difference in the voltage between two similar metals.
C— a difference in the voltage between two dissimilar metals.
D— a current generated by the temperature difference between dissimilar metal hot and cold junctions.

7293. (1) Powerplant instrument range markings show whether the current state of powerplant operation is normal, acceptable for a limited time, or unauthorized.

(2) Powerplant instrument range markings are based on installed engine operating limits which may not exceed (but are not necessarily equal to) those limits shown on the engine Type Certificate Data Sheet.

Regarding the above statements,

A— both No. 1 and No. 2 are true.
B— neither No. 1 nor No. 2 is true.
C— only No. 1 is true.
D— only No. 2 is true.

7294. Thermocouple leads

A— may be adjusted in length to fit any installation.
B— may be installed with either lead to either post of the indicator.
C— are designed for a specific installation and may not be altered.
D— may be repaired using solderless connectors.

7295. (1) Engine pressure ratio (EPR) is a ratio of the exhaust gas pressure to the engine inlet air pressure, and indicates the thrust produced.

(2) Engine pressure ratio (EPR) is a ratio of the exhaust gas pressure to the engine inlet air pressure, and indicates volumetric efficiency.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7296. What unit in a tachometer system sends information to the indicator?

A— The three-phase ac generator.
B— The two-phase ac generator.
C— The synchronous motor.
D— The miniature dc motor.

7297. (1) Generally, when a turbine engine indicates high EGT for a particular EPR (when there is no significant damage), it means that the engine is out of trim.

(2) Some turbine-powered aircraft use RPM as the primary indicator of thrust produced, others use EPR as the primary indicator.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7298. Engine pressure ratio is determined by

A— multiplying engine inlet total pressure by turbine outlet total pressure.
B— multiplying turbine outlet total pressure by engine inlet total pressure.
C— dividing turbine outlet total pressure by engine inlet total pressure.
D— dividing engine inlet total pressure by turbine outlet total pressure.

7299. Jet engine thermocouples are usually constructed of

A— iron-chromel.
B— chromel-alumel.
C— iron-constantan.
D— alumel-constantan.

7300. Which of the following instrument discrepancies require replacement of the instrument?

1. Red line missing from glass.
2. Glass cracked.
3. Case paint chipped.
4. Will not zero out.
5. Pointer loose on shaft.
6. Mounting screw loose.
7. Leaking at line B nut.
8. Fogged.

A— 2, 3, 7, 8.
B— 2, 4, 5, 8.
C— 1, 4, 5, 6.
D— 1, 2, 4, 7.

7301. A Bourdon-tube instrument may be used to indicate

1. pressure.
2. temperature.
3. position.
4. quantity.

A— 1 and 2.
B— 3 and 4.
C— 1 and 3.
D— 2 and 4.

7302. Which of the following instrument discrepancies may be corrected by an aviation mechanic?

1. Red line missing from glass.
2. Glass cracked.
3. Case paint chipped.
4. Will not zero out.
5. Pointer loose on shaft.
6. Mounting screws loose.
7. Leaking at line B nut.
8. Fogged.

A— 1, 2, 6, 7.
B— 1, 2, 3, 5.
C— 1, 2, 5, 6.
D— 1, 3, 6, 7.

7303. Which of the following instrument conditions is acceptable and does not require immediate correction?

1. Red line missing.
2. Pointer loose on shaft.
3. Glass cracked.
4. Mounting screws loose.
5. Case paint chipped.
6. Leaking at line B nut.
7. Will not zero out.
8. Fogged.

A— 1.
B— 4.
C— None.
D— 5.

7304. A change in engine manifold pressure has a direct effect on the

A— piston displacement.
B— compression ratio.
C— valve overlap period.
D— mean effective cylinder pressure.

7305. What instrument on a gas turbine engine should be monitored to minimize the possibility of a "hot" start?

A— RPM indicator.
B— Turbine inlet temperature.
C— Horsepower meter.
D— Torquemeter.

7306. In regard to using a turbine engine oil analysis program, which of the following is NOT true?

A— Generally, an accurate trend forecast may be made after an engine's first oil sample analysis.
B— It is best to start an oil analysis program on an engine when it is new.
C— A successful oil analysis program should be run over an engine's total operating life so that normal trends can be established.
D— Engines that are not new may be started on an oil analysis program with at least a moderate degree of success.

7307. On a turbine engine, with a fixed power lever position, the application of engine anti-icing will result in

A— a decrease in EPR.
B— a false EPR reading.
C— an increase in EPR.
D— a modulation of the EPR.

7308. Engine pressure ratio is the total pressure ratio between the

A— front of the compressor and the rear of the compressor.
B— aft end of the compressor and the aft end of the turbine.
C— front of the compressor and the rear of the turbine.
D— front of the engine inlet and the aft end of the compressor.

7309. What would be the possible cause if a gas turbine engine has high exhaust gas temperature, high fuel flow, and low RPM at all engine power settings?

A— Insufficient electrical power to the instrument bus.
B— Fuel control out of adjustment.
C— Loose or corroded thermocouple probes for the EGT indicator.
D— Turbine damage or loss of turbine efficiency.

7310. What is the primary purpose of the tachometer on an axial-compressor turbine engine?

A— Monitor engine RPM during cruise conditions.
B— It is the most accurate instrument for establishing thrust settings under all conditions.
C— Monitor engine RPM during starting and to indicate overspeed conditions.
D— Monitor power settings to prevent overtemperature.

7311. The engine pressure ratio (EPR) indicator is a direct indication of

A— engine thrust being produced.
B— pressures within the turbine section.
C— pressure ratio between the front and aft end of the compressor.
D— ratio of engine RPM to compressor pressure.

7312. The exhaust gas temperature (EGT) indicator on a gas turbine engine provides a relative indication of the

A— exhaust temperature.
B— temperature of the N_1 compressor.
C— temperature of the exhaust gases as they pass the exhaust cone.
D— turbine inlet temperature.

7313. What instrument indicates the thrust of a gas turbine engine?

A— Torquemeter.
B— Exhaust gas temperature indicator.
C— Turbine inlet temperature indicator.
D— Engine pressure ratio indicator.

7314. In a turbine engine, where is the turbine discharge pressure indicator sensor located?

A— At the aft end of the compressor section.
B— At a location in the exhaust cone that is determined to be subjected to the highest pressures.
C— At the eighth-stage bleed air port.
D— Immediately aft of the last turbine stage.

7315. In what units are turbine engine tachometers calibrated?

A— Percent of engine RPM.
B— Actual engine RPM.
C— Pounds per square inch (PSI).
D— Percent of engine pressure ratio.

7316. Instruments that provide readings of low or negative pressure, such as manifold pressure gauges, are usually what type?

A— Plenum chamber with calibrated weight.
B— Vane with calibrated spring.
C— Bourdon tube.
D— Diaphragm or bellows.

7317. Instruments that provide readings above approximately 10 PSI, such as oil pressure gauges, are usually what type?

A— Bimetal helix.
B— Vane with calibrated spring.
C— Bourdon tube.
D— Diaphragm or bellows.

7318. The RPM indication of a synchronous ac motor-tachometer is governed by the generator

A— voltage.
B— current.
C— resistance.
D— frequency.

7319. The EGT gauge used with reciprocating engines is primarily used to furnish temperature readings in order to

A— obtain the best mixture setting for fuel efficiency.
B— obtain the best mixture setting for engine cooling.
C— prevent engine overtemperature.
D— prevent exhaust system damage.

7320. A red triangle, dot, or diamond mark on an engine instrument face or glass indicates

A— the maximum operating limit for all normal operations.
B— the maximum limit for high transients such as starting.
C— a restricted operating range.
D— the minimum operating limit for all normal operations.

7321. Which of the following fire detectors are commonly used in the power section of an engine nacelle?

A— CO detectors.
B— Combustible mixture detectors.
C— Smoke detectors.
D— Rate-of-temperature-rise detectors.

7322. What is the function of a fire detection system?

A— To discharge the powerplant fire-extinguishing system at the origin of the fire.
B— To warn of the presence of fire in the rear section of the powerplant.
C— To activate a warning device in the event of a powerplant fire.
D— To identify the location of a powerplant fire.

7323. (Refer to figure 1.) Determine the fire-extinguisher container pressure limits when the temperature is 75 °F.

A— 320 minimum and 409 maximum.
B— 326 minimum and 415 maximum.
C— 330 minimum and 419 maximum.
D— 338 minimum and 424 maximum.

7324. How are most aircraft turbine engine fire-extinguishing systems activated?

A— Electrically discharged cartridges.
B— Manual remote control valve.
C— Piston stem and plunger.
D— Pushrod assembly.

7325. How does carbon dioxide extinguish an engine fire?

A— By dissipating or displacing oxygen in the immediate area of the fire.
B— By lowering the temperature to a point where combustion will not take place.
C— The gas spray liquifies in the heat and smothers the fire.
D— The high pressure spray lowers the temperature and blows out the fire.

7326. What retains the nitrogen charge and fire-extinguishing agent in a high rate of discharge (HRD) container?

A— Breakable disk and fusible disk.
B— Pressure switch and check tee valve.
C— Pressure gauge and cartridge.
D— Discharge plug body and strainer.

7327. A continuous-loop fire detector is what type of detector?

A— Spot detector.
B— Overheat detector.
C— Rate-of-temperature-rise detector.
D— Radiation sensing detector.

7328. What is the operating principle of the spot detector sensor in a fire detection system?

A— Resistant core material that prevents current flow at normal temperatures.
B— Fuse material that melts at high temperature.
C— A conventional thermocouple that produces a current flow.
D— A bimetallic thermoswitch that closes when heated to a high temperature.

7329. How is the fire-extinguishing agent distributed in the engine section?

A— Perforated tubing and slinger rings.
B— Spray nozzles and fluid pumps.
C— Nitrogen pressure and slinger rings.
D— Spray nozzles and perforated tubing.

7330. Which of the following is the safest fire-extinguishing agent to use from a standpoint of toxicity and corrosion hazards?

A— Chlorobromomethane (Halon 1011).
B— Dibromodifluoromethane (Halon 1202).
C— Bromochlorodifluoromethane (Halon 1211).
D— Bromotrifluoromethane (Halon 1301).

7331. Which of the following is not used to detect fires in reciprocating engine nacelles?

A— Smoke detectors.
B— Overheat detectors.
C— Rate-of-temperature-rise detectors.
D— Flame detectors.

7332. What is the principle of operation of the continuous-loop fire detector system sensor?

A— Fuse material which melts at high temperatures.
B— Core resistance material which prevents current flow at normal temperatures.
C— A conventional thermocouple which produces a current flow.
D— A bimetallic thermoswitch which closes when heated to a high temperature.

7333. The most satisfactory extinguishing agent for a carburetor or intake fire is

A— carbon dioxide.
B— dry chemical.
C— methyl bromide.
D— carbon tetrachloride.

7334. The explosive cartridge in the discharge valve of a fire-extinguisher container is

A— a life-dated unit.
B— not a life-dated unit.
C— interchangeable between bottles.
D— mechanically fired.

7335. Why does the Fenwal fire detection system use spot detectors wired in parallel between two separate circuits?

A— A control unit is used to isolate the bad system in case of malfunction.
B— This installation is equal to two systems: a prime system and a reserve system.
C— The dual terminal thermoswitch is used so that one terminal is wired to a bell, the other to a light.
D— A short may exist in either circuit without causing a false fire warning.

7336. Which of the following fire detection systems measures temperature rise compared to a reference temperature?

A— Fenwal continuous loop.
B— Thermocouple.
C— Thermal switch.
D— Lindberg continuous element.

7337. The pulling out (or down) of an illuminated fire handle in a typical large jet aircraft fire protection system commonly accomplishes what events?

A— Closes all firewall shutoff valves, disconnects the generator, and discharges a fire bottle.
B— Closes fuel shutoff, closes hydraulic shutoff, disconnects the generator field, and arms the fire-extinguishing system.
C— Closes fuel shutoff, closes hydraulic shutoff, closes the oxygen shutoff, disconnects the generator field, and arms the fire-extinguishing system.
D— Closes the fuel shutoff, closes hydraulic shutoff, disconnects the generator field, extinguishes the fire warning light, and discharges the fire-extinguishing system into the engine.

7338. A fire detection system operates on the principle of a buildup of gas pressure within a tube proportional to temperature. Which of the following systems does this statement define?

A— Thermocouple fire warning system.
B— Kidde continuous-loop system.
C— Lindberg continuous-element system.
D— Thermal switch system.

7339. The fire detection system that uses a single wire surrounded by a continuous string of ceramic beads in a tube is the

A— Fenwal system.
B— Lindberg system.
C— Kidde system.
D— thermocouple system.

7340. The fire detection system that uses two wires imbedded in a ceramic core within a tube is the

A— Fenwal system.
B— Lindberg system.
C— thermocouple system.
D— Kidde system.

7341. A fuel or oil fire is defined as a

A— class B fire.
B— class D fire.
C— class A fire.
D— class C fire.

7342. A fire detection system that operates on the rate-of-temperature rise is a

A— continuous-loop system.
B— thermocouple system.
C— thermal switch system.
D— continuous element detector.

7343. A fire involving energized electrical equipment is defined as a

A— class B fire.
B— class D fire.
C— class A fire.
D— class C fire.

7344. Two continuous-loop fire detection systems that will not test due to a broken detector element are the

A— Kidde system and the Lindberg system.
B— Kidde system and the Fenwal system.
C— thermocouple system and the Lindberg system.
D— Kidde system and the thermocouple system.

7345. In a fixed fire-extinguishing system, there are two small lines running from the system and exiting overboard. These line exit ports are covered with a blowout type indicator disc. Which of the following statements is true?

A— When the yellow indicator disc is missing, it indicates the fire-extinguishing system has had a thermal discharge.
B— When the red indicator disc is missing, it indicates the fire-extinguishing system has been normally discharged.
C— When the yellow indicator disc is missing, it indicates the fire-extinguishing system has been normally discharged.
D— When the green indicator disc is missing, it indicates the fire-extinguishing system has had a thermal discharge.

7346. The most satisfactory extinguishing agent for an electrical fire is

A— water.
B— carbon tetrachloride.
C— carbon dioxide.
D— methyl bromide.

7347. Which of the following fire detection systems will detect a fire when an element is inoperative but will not test when the test circuit is energized?

A— The thermal system and the thermocouple system.
B— The Kidde system and the thermocouple system.
C— The Kidde system and the Fenwal system.
D— The thermocouple system and the Lindberg system.

7348. Which of the following fire detection systems uses heat in the normal testing of the system?

A— The thermocouple system and the Lindberg system.
B— The Kidde system and the Fenwal system.
C— The thermocouple system and the Fenwal system.
D— The Kidde system and the thermocouple system.

7349. After a fire is extinguished, or overheat condition removed in aircraft equipped with a Systron-Donner fire detector, the detection system

A— must be manually reset.
B— automatically resets.
C— sensing component must be replaced.
D— must be recalibrated.

7350. The use of water on class D fires

A— is most effective if sprayed in a fine mist.
B— is most effective if sprayed in a solid stream.
C— will cause the fire to burn more violently and can cause explosions.
D— has no effect.

7351. For fire detection and extinguishing purposes, aircraft powerplant areas are divided into fire zones based on

A— hot and cold sections of the engine.
B— the volume and smoothness of the airflow through engine compartments.
C— engine type and size.
D— engine type and location.

7352. (Refer to figure 2.) What are the fire-extinguisher container pressure limits when the temperature is 50 °F?

A— 400 - 550 PSIG.
B— 425 - 575 PSIG.
C— 450 - 600 PSIG.
D— 475 - 625 PSIG.

7353. What device is used to convert alternating current, which has been induced into the loops of the rotating armature of a dc generator, to direct current?

A— An alternator.
B— A rectifier.
C— A commutator.
D— An inverter.

7354. A certain direct current series motor mounted within an aircraft draws more amperes during start than when it is running under its rated load. The most logical conclusion that may be drawn is

A— the starting winding is shorted.
B— the brushes are floating at operating RPM because of weak brush springs.
C— the condition is normal for this type of motor.
D— hysteresis losses have become excessive through armature bushing (or bearing) wear.

7355. The stationary field strength in a direct current generator is varied

A— by the reverse-current relay.
B— because of generator speed.
C— because of the number of rotating armature loops available.
D— according to the load requirements.

7356. What type electric motor is generally used with a direct-cranking engine starter?

A— Direct current, shunt-wound motor.
B— Direct current, series-wound motor.
C— Direct current, compound-wound motor.
D— Synchronous motor.

7357. Upon what does the output frequency of an ac generator (alternator) depend?

A— The speed of rotation and the strength of the field.
B— The strength of the field and the number of field poles.
C— The speed of rotation, the strength of the field, and the number of field poles.
D— The speed of rotation and the number of field poles.

7358. A high surge of current is required when a dc electric motor is first started. As the speed of the motor increases,

A— the counter emf decreases proportionally.
B— the applied emf increases proportionally.
C— the net counter emf increases until its value is greater than the applied emf.
D— the counter emf builds up and opposes the applied emf, thus reducing the current flow through the armature.

7359. Alternators (ac generators) that are driven by a constant-speed drive mechanism permit a nearly constant

A— voltage output.
B— amperage output.
C— number of cycles per second.
D— total power output.

7360. What is used to polish commutators or slip rings?

A— Fine emery cloth.
B— Very fine sandpaper.
C— Crocus cloth or fine oilstone.
D— Aluminum oxide or garnet paper.

7361. If a generator is malfunctioning, its voltage can be reduced to residual by actuating the

A— rheostat.
B— overvoltage circuit breaker.
C— generator master switch.
D— master solenoid.

7362. If the points in a vibrator-type voltage regulator stick in the closed position while the generator is operating, what will be the probable result?

A— Generator output voltage will decrease.
B— Generator output voltage will not be affected.
C— Generator output voltage will increase.
D— The reverse-current cutout relay will remove the generator from the line.

7363. Why is a constant-speed drive used to control the speed of some aircraft engine-driven generators?

A— So that the voltage output of the generator will remain within limits.
B— To eliminate uncontrolled surges of current to the electrical system.
C— So that both voltage and amperage output can be controlled directly.
D— So that the frequency of the alternating current output will remain constant.

7364. (1) When a properly functioning dc alternator and voltage regulating system is charging an aircraft's battery, the direction of current flow through the battery is into the positive terminal and out the negative terminal.

(2) The principal operating parts of solid state voltage regulators consist of diodes, transistors, resistors, capacitors, and relays.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7365. Aircraft that operate more than one generator connected to a common electrical system must be provided with

A— automatic generator switches that operate to isolate any generator whose output is less than 80 percent of its share of the load.
B— an automatic device that will isolate nonessential loads from the system if one of the generators fails.
C— a generator switch arrangement that will prevent any one generator from being connected to the system unless the other generators are operating.
D— individual generator switches that can be operated from the cockpit during flight.

7366. The most effective method of regulating aircraft direct current generator output is to vary, according to the load requirements, the

A— strength of the stationary field.
B— generator speed.
C— effective resistance in the load circuit.
D— number of rotating armature loops in use.

7367. Electric motors are often classified according to the method of connecting the field coils and armature. Aircraft engine starter motors are generally of which type?

A— Compound.
B— Series.
C— Differential compound.
D— Shunt (parallel).

7368. As the generator load is increased (within its rated capacity), the voltage will

A— decrease and the amperage output will increase.
B— increase and the amperage output will increase.
C— remain constant and the amperage output will increase.
D— remain constant and the amperage output will decrease.

7369. As the flux density in the field of a dc generator increases and the current flow to the system increases,

A— the force required to turn the generator decreases.
B— the generator voltage decreases.
C— the generator amperage decreases.
D— the force required to turn the generator increases.

7370. What is the purpose of a reverse-current cutout relay?

A— It eliminates the possibility of reversed polarity of the generator output current.
B— It prevents overloading the generator.
C— It prevents fluctuations of generator voltage.
D— It opens the main generator circuit whenever the generator voltage drops below the battery voltage.

7371. Generator voltage will not build up when the field is flashed and solder is found on the brush cover plate. These are most likely indications of

A— an open armature.
B— a sheared armature shaft.
C— excessive brush arcing.
D— armature shaft bearings overheating.

7372. Why is it unnecessary to flash the field of the exciter on a brushless alternator?

A— The exciter is constantly charged by battery voltage.
B— Brushless alternators do not have exciters.
C— Permanent magnets are installed in the main field poles.
D— The slip ring employed by the brushless alternator retains a permanent charge.

7373. One way that the automatic ignition relight systems are activated on gas turbine engines is by a

A— drop in compressor discharge pressure.
B— sensing switch located in the tailpipe.
C— drop in fuel flow.
D— drop in compressor air inlet velocity.

7374. How are the rotor windings of an aircraft alternator usually excited?

A— By a constant ac voltage from the battery.
B— With alternating current from a permanent condenser.
C— By a constant ac voltage.
D— By a variable direct current.

7375. What precaution is usually taken to prevent electrolyte from freezing in a lead acid battery?

A— Place the aircraft in a hangar.
B— Remove the battery and place it in a warm area.
C— Keep the battery fully charged.
D— Drain the electrolyte.

7376. What is the ampere-hour rating of a storage battery that is designed to deliver 45 amperes for 2.5 hours?

A— 112.5 ampere-hour.
B— 47.5 ampere-hour.
C— 90.0 ampere-hour.
D— 45.0 ampere-hour.

7377. How many hours will a 140 ampere-hour battery deliver 15 amperes?

A— 15.0 hours.
B— 1.40 hours.
C— 9.33 hours.
D— 14.0 hours.

7378. What is the basic advantage of using ac for electrical power for a large aircraft?

A— AC systems operate at higher voltage than dc systems and therefore use less current and can use smaller and lighter weight wiring.
B— AC systems operate at lower voltage than dc systems and therefore use less current and can use smaller and lighter weight wiring.
C— AC systems operate at higher voltage than dc systems and therefore use more current and can use smaller and lighter weight wiring.
D— AC systems operate at lower voltage than dc systems and therefore use more current and can use smaller and lighter weight wiring.

7379. What are two types of ac motors that are used to produce a relatively high starting torque?

A— Shaded pole and shunt field.
B— Shunt field and single phase.
C— Three-phase induction and repulsion.
D— Single-phase induction and rotating field.

7380. (1) Alternators are rated in volt-amps, which is a measure of the apparent power being produced by the generator.

(2) Alternating current has the advantage over direct current in that its voltage and current can easily be stepped up or down.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7381. What is the frequency of most aircraft alternating current?

A— 115 Hertz.
B— 120 Hertz.
C— 220 Hertz.
D— 400 Hertz.

7382. The reason for flashing the field in a generator is to

A— restore correct polarity and/or residual magnetism to the field poles.
B— increase generator capacity.
C— restore proper resistance to the field windings.
D— remove excessive deposits.

7383. The part of a dc alternator power system that prevents reverse flow of current from the battery to the alternator is the

A— reverse current relay.
B— voltage regulator.
C— differential reverse current relay.
D— rectifier.

7384. The generating system of an aircraft charges the battery by using

A— constant current and varying voltage.
B— constant voltage and varying current.
C— constant voltage and constant current.
D— varying current and varying voltage.

7385. The constant current method of charging a ni-cad battery

A— will bring it up to fully charged in the shortest amount of time.
B— will lead to cell imbalance over a period of time.
C— is the method most effective in maintaining cell balance.
D— is the method most likely to allow thermal runaway.

7386. (Refer to figure 3.) The following data concerning the installation of an electrical unit is known: current requirements for continuous operation — 11 amperes; measured cable length — 45 feet; system voltage — 28 volts (do not exceed 1 volt drop); cable in conduit and bundles. What is the minimum size copper electrical cable that may be selected?

A— No. 10.
B— No. 12.
C— No. 14.
D— No. 18.

7387. Which of the following aircraft circuits does not contain a fuse?

A— Generator circuit.
B— Air-conditioning circuit.
C— Exterior lighting circuit.
D— Starter circuit.

7388. The maximum number of terminals that may be connected to any one terminal stud in an aircraft electrical system is

A— four.
B— one.
C— two.
D— three.

7389. What is the maximum number of bonding jumper wires that may be attached to one terminal grounded to a flat surface?

A— Four.
B— Five.
C— Two.
D— Three.

7390. As a general rule, starter brushes are replaced when they are

A— approximately one-half their original length.
B— approximately one-fourth their original length.
C— approximately one-third their original length.
D— approximately two-thirds their original length.

7391. When installing an electrical switch, under which of the following conditions should the switch be derated from its nominal current rating?

A— Conductive circuits.
B— Capacitive circuits.
C— Low rush-in circuits.
D— Direct-current motor circuits.

7392. The resistance of the current return path through the aircraft is always considered negligible, provided the

A— voltage drop across the circuit is checked.
B— circuit resistance is checked.
C— generator is properly grounded.
D— structure is adequately bonded.

7393. In order to reduce the possibility of shorting or grounding of circuits while separated, AN and MS electrical connectors should

A— be installed with the socket section on the ground side of the circuit.
B— be installed with the pin section on the ground side of the circuit.
C— be coated with a non-conductive material.
D— not be left disconnected when power is to be applied to the aircraft.

7394. When does current flow through the coil of a solenoid-operated electrical switch?

A— Continually, as long as the aircraft's electrical system master switch is on.
B— Continually, as long as the control circuit is complete.
C— Only for a short time period following movement of the control switch.
D— Only until the movable points contact the stationary points.

7395. It is necessary to determine that the electrical load limit of a 28-volt, 75-amp generator, installed in a particular aircraft, has not been exceeded. By making a ground check, it is determined that the battery furnished 57 amperes to the system when all equipment that can continuously draw electrical power in flight is turned on. This type of load determination

A— cannot be made because generator capacity exceeds 2-1/2 kW.
B— can be made, but the load will exceed the generator load limit.
C— can be made, and the load will be within the generator load limit.
D— cannot be made on direct current electrical systems.

7396. What type of lubricant may be used to aid in pulling electrical wires or cables through conduits?

A— Lightweight, vegetable-base grease.
B— Powdered graphite.
C— Soapstone talc.
D— Rubber lubricant.

7397. Which of the following is regulated in a generator to control its voltage output?

A— Speed of the armature.
B— Number of windings in the armature.
C— The strength of the field.
D— The armature resistance.

7398. Bonding jumpers should be designed and installed in such a manner that they

A— are not subjected to flexing by relative motion of airframe or engine components.
B— limit the relative motion of the parts to which they are attached by acting as a secondary stop.
C— provide a low electrical resistance in the ground circuit.
D— prevent buildup of a static electrical charge between the airframe and the surrounding atmosphere.

7399. On a turbine engine, with the starter-generator circuit energized, the engine would not crank. The probable cause would be the

A— overvoltage relay is defective.
B— throttle ignition switch is defective.
C— igniter relay is defective.
D— starter relay is defective.

7400. Arcing at the brushes and burning of the commutator of a motor may be caused by

A— weak brush springs.
B— excessive brush spring tension.
C— smooth commutator.
D— low mica.

7401. The maximum allowable voltage drop between the generator and the bus bar is

A— 1 percent of the regulated voltage.
B— greater than the voltage drop permitted between the battery and the bus bar.
C— 2 percent of the regulated voltage.
D— less than the voltage drop permitted between the battery and the bus bar.

7402. ON-OFF two position engine electrical switches should be installed

A— upside down to prevent debris from affecting the contacts.
B— so that the toggle will move in the same direction as the desired motion of the unit controlled.
C— always under a guard.
D— so the ON position is reached by a forward or upward motion.

7403. When selecting an electrical switch for installation in an aircraft circuit utilizing a direct current motor,

A— a switch designed for dc should be chosen.
B— the switch must be a single pole, single throw (SPST).
C— a derating factor should be applied.
D— only switches with screw-type terminal connections should be used.

7404. When installing electrical wiring parallel to a fuel line, the wiring should be

A— in a metal conduit.
B— in a vinyl sleeve.
C— above the fuel line.
D— below the fuel line.

7405. (Refer to figure 3.) In a 28-volt system, what is the maximum continuous current that can be carried by a single No. 10 copper wire 25 feet long, routed in free air?

A— 15 amperes.
B— 20 amperes.
C— 35 amperes.
D— 28 amperes.

7406. What speed must an eight-pole ac generator turn to produce 400-Hertz ac?

A— 400 RPM.
B— 1,200 RPM.
C— 6,000 RPM.
D— 12,000 RPM.

7407. How many basic types of circuit breakers are used in powerplant installation electrical systems?

A— One.
B— Two.
C— Three.
D— Four.

7408. Which Federal Aviation Regulation specifies that each resettable circuit protective device requires a manual operation to restore service after the device has interrupted the circuit?

A— FAR Part 23.
B— FAR Part 33.
C— FAR Part 43.
D— FAR Part 91.

7409. Which Federal Aviation Regulation requirement prevents the use of automatic reset circuit breakers?

A— FAR Part 21.
B— FAR Part 23.
C— FAR Part 43.
D— FAR Part 91.

7410. (1) A push-pull type circuit breaker can be used as a switch as well as a circuit breaker.

(2) A push-to-reset type circuit breaker can be used as a switch.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7411. (1) Most modern aircraft use circuit breakers rather than fuses to protect their electrical circuits.

(2) Federal Aviation Regulations Part 23 requires that all electrical circuits incorporate some form of circuit protective device.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7412. Electrical switches are rated according to the

A— voltage and the current they can control.
B— resistance rating of the switch and the wiring.
C— temperature and capacitance rating.
D— resistance and the temperature rating.

7413. Electrical circuit protection devices are installed primarily to protect the

A— relays.
B— switches.
C— units.
D— wiring.

7414. (1) Electrical circuit protection devices are rated based on the amount of current that can be carried without overheating the wiring insulation.

(2) A "trip-free" circuit breaker makes it impossible to manually hold the circuit closed when excessive current is flowing.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7415. Which of the following Federal Aviation Regulations require that all aircraft using fuses as the circuit protective devices carry "one spare set of fuses, or three spare fuses of each kind required"?

A— FAR Part 21.
B— FAR Part 23.
C— FAR Part 43.
D— FAR Part 91.

7416. What is the smallest terminal stud allowed for aircraft electrical power systems?

A— No. 4.
B— No. 6.
C— No. 8.
D— No. 10.

7417. A typical barrier type aircraft terminal strip is made of

A— paper-base phenolic compound.
B— polyester resin and graphite compound.
C— layered aluminum impregnated with compound.
D— compressed vinyl impregnated with aluminum.

7418. A term commonly used when two or more electrical terminals are installed on a single lug of a terminal strip is

A— strapping.
B— stepping.
C— stacking.
D— fanning.

7419. (1) Electrical wires larger than 10 gauge use uninsulated terminals.

(2) Electrical wires smaller than 10 gauge use uninsulated terminals.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7420. Aircraft electrical wire size is measured according to the

A— Military Specification system.
B— American Wire Gauge system.
C— Society of Aeronautical Engineers system.
D— Technical Standard Order system.

7421. Aircraft copper electrical wire is coated with tin, silver, or nickel in order to

A— improve conductivity.
B— add strength.
C— prevent oxidization.
D— prevent crystallization from vibration.

7422. What will be the result of operating an engine in extremely high temperatures using a lubricant recommended by the manufacturer for a much lower temperature?

A— The oil pressure will be higher than normal.
B— The oil pressure gauge will not read accurately.
C— The oil temperature and oil pressure will be higher than normal.
D— The oil pressure will be lower than normal.

7423. (1) Gas turbine and reciprocating engine oils can be mixed or used interchangeably.

(2) Most gas turbine engine oils are synthetic.

Regarding the above statements,

A— only No. 2 is true.
B— only No. 1 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7424. An oil separator is generally associated with which of the following?

A— Engine-driven oil pressure pump.
B— Engine-driven vacuum pump.
C— Cuno oil filter.
D— Strainer-type filter.

7425. The time in seconds required for exactly 60 cubic centimeters of oil to flow through an accurately calibrated orifice at a specific temperature is recorded as a measurement of the oil's

A— flash point.
B— specific gravity.
C— viscosity.
D— pour point.

7426. Upon what quality or characteristic of a lubricating oil is its viscosity index based?

A— Its ability to maintain film strength.
B— Its resistance to flow at a standard temperature as compared to high grade paraffin-base oil at the same temperature.
C— Its rate of change in viscosity with temperature change.
D— Its rate of flow through an orifice at a standard temperature.

7427. Lubricating oils with high viscosity index ratings are oils

A— in which the viscosity does not vary much with temperature change.
B— in which the viscosity varies considerably with temperature change.
C— which have high pour points.
D— which have high SAE numbers.

7428. Why are synthetic lubricants used in high-performance turbine engines?

A— Synthetic oils do not require filtering and are less expensive.
B— The load-carrying characteristics of petroleum-base oils have a low degree of chemical stability.
C— Additives required in turbine engines cannot be mixed with petroleum oils.
D— They have less tendency to produce lacquer or coke and less tendency to evaporate at high temperatures.

7429. The oil used in reciprocating engines has a relatively high viscosity due to

A— the reduced ability of thin oils to maintain adequate film strength at altitude (reduced atmospheric pressure).
B— the relatively high rotational speeds.
C— its lower oxidation rate at elevated temperatures.
D— large clearances and high operating temperatures.

7430. If all other requirements can be met, what type of oil should be used to achieve theoretically perfect engine lubrication?

A— The thinnest oil that will stay in place and maintain a reasonable film strength.
B— An oil that combines high viscosity and low demulsibility.
C— The thickest oil that will stay in place and maintain a reasonable film strength.
D— An oil that combines a low viscosity index and a high neutralization number.

7431. In addition to lubricating (reducing friction between moving parts), engine oil performs what functions?

1. Cools.
2. Seals.
3. Cleans.
4. Prevents corrosion.
5. Cushions impact (shock) loads.

A— 1, 2, 3, 4.
B— 1, 2, 3, 4, 5.
C— 1, 3, 4.
D— 2, 3, 4.

7432. The type of lubricating oil that is used in a turbine aircraft engine is

A— synthetic.
B— petrolatum.
C— 50-50 blend of petroleum and synthetic.
D— 30-70 blend of petroleum and synthetic.

7433. Which of these characteristics is desirable in turbine engine oil?

A— High pour point.
B— Low flash point.
C— High flash point.
D— High volatility.

7434. The viscosity of a liquid is a measure of its

A— resistance to flow.
B— rate of change of internal friction with change in temperature.
C— density.
D— ability to transmit force.

7435. What type of oil system is usually found on turbojet engines?

A— Dry sump, pressure, and spray.
B— Wet sump, dip, and pressure.
C— Dry sump, dip, and splash.
D— Wet sump, spray, and splash.

7436. The engine's lubricating oil aids in reducing friction, cushioning shock, and

A— cooling the engine.
B— preventing fatigue of engine parts.
C— heating fuel in carburetor to prevent ice.
D— preventing a buildup of internal pressures in the crankcase.

7437. Which of the following factors helps determine the proper grade of oil to use in a particular engine?

A— High viscosity to provide good flow characteristics.
B— Adequate lubrication in various attitudes of flight.
C— Positive introduction of oil to the bearings.
D— Operating speeds of bearings.

7438. Specific gravity is a comparison of the weight of a substance to the weight of an equal volume of

A— oil at a specific temperature.
B— distilled water at a specific temperature.
C— mercury at a specific temperature.
D— isopropyl at a specific temperature.

7439. Which of the following has the greatest effect on the viscosity of lubricating oil?

A— Temperature.
B— Oiliness.
C— Pressure.
D— Volatility.

7440. What advantage do mineral base lubricants have over vegetable oil base lubricants when used in aircraft engines?

A— Cooling ability.
B— Sealing quality.
C— Chemical stability.
D— Friction resistance.

7441. Lubricants may be classified according to their origin. Satisfactory aircraft engine lubricants are

A— mineral or synthetic based.
B— animal, vegetable, mineral, or synthetic based.
C— vegetable, mineral, or synthetic based.
D— animal, mineral, or synthetic based.

7442. High tooth pressures and high rubbing velocities, such as occur with spur-type gears, require the use of

A— an EP lubricant.
B— straight mineral oil.
C— metallic ash detergent oil.
D— a metal oxide lubricant.

7443. Manufacturers normally require turbine engine oil servicing within a short time after engine shutdown primarily in order to

A— prevent overservicing.
B— prevent underservicing.
C— help dilute and neutralize any contaminants that may already be present in the engine's oil system.
D— provide a better indication of any oil leaks in the system.

7444. What type of oil do most engine manufacturers recommend for new reciprocating engine break-in?

A— Metallic-ash detergent oil.
B— Ashless-dispersant oil.
C— Straight mineral oil.
D— Semi-synthetic oil.

7445. What type of oil do most engine manufacturers recommend after new reciprocating engine break-in?

A— Metallic-ash detergent oil.
B— Ashless-dispersant oil.
C— Straight mineral oil.
D— Metallic-ash synthetic oil.

7446. The type of oil pumps most commonly used on turbine engines are classified as

A— positive displacement.
B— variable displacement.
C— constant speed.
D— fixed pressure.

7447. Abrupt power reductions while operating a reciprocating engine should be avoided because of the possibility of

A— causing the cylinders to shrink enough around heat-expanded pistons to cause piston scuffing.
B— overloading the power section with oil.
C— causing oil starvation of bearings.
D— causing cylinder head cracking.

7448. The engine oil temperature regulator is usually located between which of the following on a dry sump reciprocating engine?

A— The engine oil supply pump and the internal lubrication system.
B— The scavenger pump outlet and the oil storage tank.
C— The oil storage tank and the engine oil supply pump.
D— The sumps and the scavenger pump inlet.

7449. What will happen to the return oil if the oil line between the scavenger pump and the oil cooler separates?

A— Oil will accumulate in the engine.
B— The return oil will be pumped overboard.
C— The cooler check valve will close and force the oil to bypass the cooler core and return to the tank via the cold oil line.
D— The scavenger return line check valve will close and force the oil to bypass directly to the intake side of the pressure pump.

7450. At cruise RPM, some oil will flow through the relief valve of a gear-type engine oil pump. This is normal as the relief valve is set at a pressure which is

A— lower than the pump inlet pressure.
B— lower than the pressure pump capabilities.
C— higher than pressure pump capabilities.
D— lower than the scavenger pump capabilities.

7451. (1) Fuel may be used to cool oil in gas turbine engines.

(2) Ram air may be used to cool oil in gas turbine engines.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— neither No. 1 nor No. 2 is true.
D— both No. 1 and No. 2 are true.

7452. In a reciprocating engine oil system, the temperature bulb senses oil temperature

A— and indicates the average oil temperature.
B— at a point after the oil has passed through the oil cooler.
C— while the oil is in the hottest area of the engine.
D— immediately before the oil enters the oil cooler.

7453. The main bearing oil damper compartments utilized in some turbine engines are used primarily to

A— provide lubrication of bearings from the beginning of starting rotation until normal oil pressure is established.
B— keep carbon oil seals moist with engine oil in order to prevent "dry" rubbing condition and leakage on engine start.
C— provide an oil film between the outer race and the bearing housing in order to reduce vibration tendencies in the rotor system.
D— prevent surges in oil pressure to the bearings.

7454. What is the purpose of the last chance oil filters?

A— To allow the oil to bypass the main filter in the event it becomes clogged.
B— To prevent damage to the oil spray nozzle.
C— To filter the oil immediately before it enters the main bearings.
D— To assure a clean supply of oil to the lubrication system.

7455. In a jet engine which uses a fuel-oil heat exchanger, the oil temperature is controlled by a thermostatic valve that regulates the flow of

A— air past the heat exchanger.
B— fuel through the heat exchanger.
C— both fuel and oil through the heat exchanger.
D— oil through the heat exchanger.

7456. What prevents pressure within the lubricating oil tank from rising above or falling below ambient pressure (reciprocating engine)?

A— Oil tank check valve.
B— Oil pressure relief valve.
C— Oil tank vent.
D— Thermostatic bypass valve.

7457. In an axial-flow turbine engine, compressor bleed-air is sometimes used to aid in cooling the

A— oil.
B— inlet guide vanes.
C— oil cooler.
D— turbine, vanes, blades, and bearings.

7458. Oil picks up the most heat from which of the following turbine engine components?

A— Rotor coupling.
B— Compressor bearing.
C— Turbine stator blades.
D— Turbine bearing.

7459. Which of the following is a function of the fuel-oil heat exchanger on a turbojet engine?

A— Removes oil vapors.
B— Aerates the fuel.
C— Emulsifies the oil.
D— Increases fuel temperature.

7460. According to Federal Aviation Regulations (FAR's), oil tank fillers on turbine engines must be marked with the word

A— "oil" and the type and grade of oil specified by the manufacturer.
B— "capacity" and grade.
C— "oil" and tank capacity.
D— "oil."

7461. After making a welded repair to a pressurized-type turbine engine oil tank, the tank should be pressure checked to

A— not less than 5 PSI plus the maximum operating pressure of the tank.
B— not less than 5 PSI plus the average operating pressure of the tank.
C— 5 PSI.
D— 6.5 PSI.

7462. Why are fixed orifice nozzles used in the lubrication system of gas turbine engines?

A— To provide a relatively constant oil flow to the main bearings at all engine speeds.
B— To keep back pressure on the oil pump, thus preventing an air lock.
C— To protect the oil seals by preventing excessive pressure from entering the bearing cavities.
D— To reduce the oil pressure.

7463. Possible failure related ferrous-metal particles in turbine engine oil cause an (electrical) indicating-type magnetic chip detector to indicate their presence by

A— disturbing the eddy currents around the detector tip.
B— disturbing the magnetic lines of flux around the detector tip.
C— bridging the gap between the detector center (positive) electrode and the ground electrode.
D— generating a small electric current that is caused by the particles being in contact with the dissimilar metal of the detector tip.

7464. What would be the probable result if the oil system pressure relief valve should stick in the open position on a turbine engine?

A— Increased oil pressure.
B— Decreased oil temperature.
C— Insufficient lubrication.
D— Pressurization of the case and increased oil leakage.

7465. What is the primary purpose of the oil-to-fuel heat exchanger?

A— Cool the fuel.
B— Cool the oil.
C— De-aerate the oil.
D— Decrease the viscosity of the oil.

7466. What unit in an aircraft engine lubrication system is adjusted to maintain the desired system pressure?

A— Oil pressure relief valve.
B— Oil filter bypass valve.
C— Oil pump.
D— Oil pressure indicator.

7467. Low oil pressure can be detrimental to the internal engine components. However, high oil pressure

A— is desirable for maximum bearing life.
B— should be limited to the engine manufacturer's recommendations.
C— is not important and may be ignored.
D— will not occur because of pressure losses around the bearings.

7468. What is the primary purpose of the oil breather pressurization system that is used on turbine engines?

A— Positive pressure prevents contaminants from entering the system.
B— Prevents foaming of the oil.
C— Allows aeration of the oil for better lubrication because of the air/oil mist.
D— Provides a proper oil spray pattern from the main bearing oil jets.

7469. The purpose of directing bleed air to the bearings on turbine engines is to

A— increase oil pressure at the bearings.
B— provide a high volume oil flow across the bearings.
C— warm cold engine oil quickly.
D— aid in removing heat from the bearings.

7470. Some larger reciprocating engines use a compensating oil pressure relief valve to

A— provide a high engine oil pressure when the oil is cold and automatically lower the oil pressure when the oil warms up.
B— compensate for changes in atmospheric pressure that accompany altitude changes.
C— automatically keep oil pressure nearly the same whether the oil is warm or cold.
D— bypass the oil filter when the oil is too cold for proper filtering, or the filter is clogged.

7471. In order to relieve excessive pump pressure in an engine's internal oil system, most engines are equipped with a

A— vent.
B— bypass valve.
C— breather.
D— relief valve.

7472. What is the source of most of the heat that is absorbed by the lubricating oil in a reciprocating engine?

A— Connecting rod bearings.
B— Crankshaft main bearings.
C— Exhaust valves.
D— Pistons and cylinder walls.

7473. How are the teeth of the gears in the accessory section of an engine normally lubricated?

A— By splashed or sprayed oil.
B— By submerging the load-bearing portions in oil.
C— By surrounding the load-bearing portions with baffles or housings within which oil pressure can be maintained.
D— By pressure oil directed from the gear hub out through the webs (spokes) to the individual teeth.

7474. What is the purpose of the check valve generally used in a dry sump lubrication system?

A— To prevent the oil from the oil temperature regulator from returning to the crankcase during inoperative periods.
B— To prevent the scavenger pump from losing its prime.
C— To prevent the oil from the supply tank from seeping into the crankcase during inoperative periods.
D— To prevent the oil from the pressure pump from entering the scavenger system.

7475. From the following, identify the factor that has the least effect on the oil consumption of a specific engine.

A— Mechanical efficiency.
B— Engine temperature.
C— Engine RPM.
D— Lubricant characteristics.

7476. How is the oil collected by the piston oil ring returned to the crankcase?

A— Down vertical slots cut in the piston wall between the piston oil ring groove and the piston skirt.
B— Through hollow piston pins.
C— Through holes drilled in the piston oil ring groove.
D— Through holes drilled in the piston pin recess.

7477. Which of the following lubrication system components is never located between the pressure pump and the engine pressure system?

A— Oil temperature bulb.
B— Oil filter or strainer.
C— Fuel line for oil dilution system.
D— Check valve.

7478. As an aid to cold-weather starting, the oil dilution system thins the oil with

A— Jet A-1.
B— kerosene.
C— alcohol.
D— gasoline.

7479. The basic oil pressure relief valve setting for a newly overhauled engine is made

A— within the first 30 seconds of engine operation.
B— when the oil is at a higher than normal temperature to assure high oil pressure at normal oil temperature.
C— within 1 minute after the first start.
D— in the overhaul shop.

7480. Where is the oil temperature bulb located on a dry sump reciprocating engine?

A— Oil inlet line.
B— Oil cooler.
C— Oil outlet line.
D— Oil scavenge sump.

7481. Cylinder walls are usually lubricated by

A— splashed or sprayed oil.
B— a direct pressure system fed through the crankshaft, connecting rods, and the piston pins to the oil control ring groove in the piston.
C— oil that is picked up by the oil control ring when the piston is at bottom center.
D— oil migration past the rings during the intake stroke.

7482. If a full-flow oil filter is used on an aircraft engine, and the filter becomes clogged, the

A— pressure buildup in the filter will collapse the screen and close off the oil supply to the engine.
B— oil will be bypassed to the magnetic oil sump plug where metallic particles will be removed.
C— oil will be bypassed back to the oil tank hopper where sediment and foreign matter will settle out prior to passage through the engine.
D— bypass valve will open and the oil pump will supply unfiltered oil to the engine.

7483. Oil accumulation in the cylinders of an inverted in-line engine and in the lower cylinders of a radial engine is normally reduced or prevented by

A— reversed oil control rings.
B— closing the oil shutoff valve after shutdown.
C— routing the valve-operating mechanism lubricating oil to a separate scavenger pump.
D— extended cylinder skirts.

7484. What is the primary purpose of changing aircraft engine lubricating oils at predetermined periods?

A— The oil gradually becomes too thick.
B— The oil becomes diluted with gasoline washing past the pistons into the crankcase.
C— The oil becomes contaminated with moisture, acids, and finely divided suspended solid particles.
D— Exposure to heat and oxygen causes a decreased ability to maintain a film under load.

7485. What determines the minimum particle size which will be excluded or filtered by a cuno-type (stacked disc, edge filtration) filter?

A— The number of discs in the assembly.
B— The disc thickness.
C— The spacer thickness.
D— Both the number and thickness of the discs in the assembly.

7486. What is the primary purpose of the hopper located in the oil supply tank of some dry sump engine installations?

A— To reduce the time required to warm the oil to operating temperatures.
B— To reduce surface aeration of the hot oil and thus reduce oxidation and the formation of sludge and varnish.
C— To cause warm oil to mix with the cold oil without stratification and subsequent variation in viscosity.
D— To impart a centrifugal motion to the oil entering the tank so that the foreign particles in the oil will separate more readily.

7487. The purpose of the flow control valve in a reciprocating engine oil system is to

A— direct oil through or around the oil cooler.
B— deliver cold oil to the hopper tank.
C— relieve excessive pressures in the oil cooler.
D— compensate for volumetric increases due to foaming of the oil.

7488. Where are sludge chambers, when used in aircraft engine lubrication systems, usually located?

A— In the crankshaft throws.
B— Adjacent to the scavenger pumps.
C— In the oil storage tank.
D— In the crankshaft tail shaft if transfer rings are used.

7489. Why are all oil tanks equipped with vent lines?

A— To prevent pressure buildup in the engine.
B— To eliminate foaming in the tank.
C— To prevent pressure buildup in the tank.
D— To eliminate foaming in the engine.

7490. Excessive oil is prevented from accumulating on the cylinder walls of a reciprocating engine by

A— the design shape of the piston skirt.
B— holes drilled in the piston skirt.
C— internal engine pressure bleeding past the ring grooves.
D— oil control rings on the pistons.

7491. (1) Wet sump oil systems are most commonly used in gas turbine engines.

(2) Oil in gas turbine engines is not diluted during cold weather.

Regarding the above statements,

A— only No. 1 is true.
B— both No. 1 and No. 2 are true.
C— only No. 2 is true.
D— neither No. 1 nor No. 2 is true.

7492. The pumping capacity of the scavenger pump in a dry sump aircraft engine's lubrication system

A— is greater than the capacity of the oil supply pump.
B— is less than the capacity of the oil supply pump.
C— is usually equal to the capacity of the oil supply pump in order to maintain constant oiling conditions.
D— varies according to the oil supply tank capacity and not according to the oil supply pump capacity.

7493. In which of the following situations will the oil cooler automatic bypass valve be open the greatest amount?

A— Engine oil at normal operating temperature.
B— Engine oil above normal operating temperature.
C— Engine oil below normal operating temperature.
D— Engine stopped with no oil flowing after runup.

7494. In order to maintain a constant oil pressure as the clearances between the moving parts of an engine increase through normal wear, the supply pump output

A— decreases as the resistance offered to the flow of oil increases.
B— increases as the resistance offered to the flow of oil increases.
C— remains relatively constant (at a given RPM) with less oil being returned to the pump inlet or sump by the relief valve.
D— remains relatively constant (at a given RPM) with more oil being returned to the pump inlet or sump by the relief valve.

7495. The overhead valve assemblies of opposed engines used in helicopters are lubricated by means of a

A— forced feed system.
B— splash and spray system.
C— pressure system.
D— combination splash and spray and gravity feed system.

7496. What will result if an oil filter screen becomes completely blocked?

A— Oil will flow at 75 percent of the normal rate through the system.
B— Oil flow to the engine will stop.
C— Oil flow from the engine will stop.
D— Oil will flow at the normal rate through the system.

7497. A turbine engine dry sump lubrication system of the self-contained, high-pressure design

A— uses the same storage area as a wet-sump engine.
B— has no heat exchanger.
C— consists of pressure, breather, and scavenge subsystems.
D— stores oil in the engine crankcase.

7498. Lube system last chance filters in turbine engines are usually cleaned

A— during annual inspection.
B— during 100-hour inspections.
C— during overhaul.
D— at oil change intervals.

7499. How are the piston pins of most aircraft engines lubricated?

A— By pressure oil through a drilled passageway in the heavy web portion of the connecting rod.
B— By oil which is sprayed or thrown by the master or connecting rods.
C— By the action of the oil control ring and the series of holes drilled in the ring groove directing oil to the pin and piston pin boss.
D— By pressure oil through a drilled passage the entire length of the link rod.

7500. The vent line connecting the oil supply tank and the engine in some dry sump engine installations permits

A— pressurization of the oil supply to prevent cavitation of the oil supply pump.
B— oil vapors from the engine to be condensed and drained into the oil supply tank.
C— the oil tank to be vented through the normal engine vent.
D— the engine and oil supply tank to be vented to each other, thus avoiding the use of an atmospheric vent.

7501. An engine lubrication system pressure relief valve is usually located between the

A— oil cooler and the scavenger pump.
B— scavenger pump and the external oil system.
C— pump and the internal oil system.
D— sump and the scavenger pump.

7502. Where is the oil of a dry sump reciprocating engine exposed to the temperature control valve sensing unit?

A— Oil cooler inlet.
B— Engine outlet.
C— Oil strainer.
D— Engine inlet.

7503. Under which of the following conditions is the oil cooler flow control valve open on a reciprocating engine?

A— When the temperature of the oil returning from the engine is too high.
B— When the engine pump output volume exceeds the scavenger pump output volume.
C— When the temperature of the oil returning from the engine is too low.
D— When the scavenger pump output volume exceeds the engine pump input volume.

7504. Most turbine engine oil tanks incorporate a check relief valve in the tank venting system. The purpose of this valve is to

A— prevent oil pump cavitation by maintaining a constant pressure on the oil pump inlet.
B— prevent the return oil from foaming in the tank.
C— prevent loss of oil overboard during aircraft acceleration.
D— prevent oil from draining from the oil tank and flooding the engine sump when the engine is shut down.

7505. In a reciprocating engine, oil is directed from the pressure relief valve to the inlet side of the

A— scavenger pump.
B— thermostatic control.
C— oil temperature regulator.
D— pressure pump.

7506. If the oil in the oil cooler core and annular jacket becomes congealed, what unit prevents damage to the cooler?

A— Baffle plates.
B— Oil pressure relief valve.
C— Airflow control valve bellows.
D— Surge protection valve.

7507. The primary source of oil contamination in a normally operating reciprocating engine is

A— metallic deposits as a result of engine wear.
B— atmospheric dust and pollen.
C— combustion deposits due to combustion chamber blow-by and oil migration on the cylinder walls.
D— oil decomposition as a result of exposure to oxygen in the air.

7508. A rise in oil temperature and a drop in oil pressure may be caused by

A— the temperature regulator sticking shut.
B— the pressure relief valve sticking shut.
C— foreign material under the relief valve.
D— improper starting procedure, engine not warmed up.

7509. The main oil filters strain the oil at which point in the system?

A— Immediately after it leaves the scavenger pump.
B— Immediately before it enters the pressure pump.
C— Just before it passes through the spray nozzles.
D— Just as it leaves the pressure pump.

7510. Which type valve prevents oil from entering the main accessory case when the engine is not running?

A— Bypass.
B— Relief.
C— Check.
D— Restriction.

7511. An oil tank having a capacity of 5 gallons must have an expansion space of

A— 3 quarts.
B— 2 quarts.
C— 4 quarts.
D— 5 quarts.

7512. As a general rule, a small amount of small fuzzy particles or gray metallic paste on a turbine engine magnetic chip detector

A— is considered to be the result of normal wear.
B— is an indication of a moderately high level of combustion products in the engine oil.
C— indicates an imminent component failure.
D— indicates accelerated generalized wear.

7513. Why is expansion space required in an engine oil supply tank?

A— To eliminate oil foaming.
B— For oil enlargement and collection of foam.
C— To ensure gravity oil feed.
D— For proper oil tank ventilation.

7514. The air and oil are separated in a jet engine oil system by returning the scavenged oil to

A— a centrifugal separator.
B— the bottom of the reservoir.
C— a pressurized tank.
D— a de-aerator at the top of the reservoir.

7515. Which of the following bearing types must be continuously lubricated by pressure oil?

A— Ball.
B— Roller.
C— Tapered.
D— Plain.

7516. When a magneto is disassembled, keepers are usually placed across the poles of the rotating magnet to reduce the loss of magnetism. These keepers are usually made of

A— chrome magnet steel.
B— soft iron.
C— cobalt steel.
D— laminated high-carbon steel.

7517. How is the strength of a magneto magnet checked?

A— Hold the points open and check the output of the primary coil with an ac ammeter while operating the magneto at a specified speed.
B— Check the ac voltage reading at the breaker points.
C— Check the output of the secondary coil with an ac ammeter while operating the magneto at a specified speed.
D— While operating the magneto at any speed, determine the size of air gap the spark from the magneto will jump.

7518. The E-gap angle is usually defined as the number of degrees between the neutral position of the rotating magnet and the position

A— where the contact points close.
B— where the contact points open.
C— of greatest magnetic flux density.
D— at which the secondary current is lowest.

7519. The greatest density of flux lines in the magnetic circuit of a rotating magnet-type magneto occurs when the magnet is in what position?

A— The neutral position.
B— Full alignment with the field shoe faces.
C— A certain angular displacement beyond the neutral position, referred to as E-gap angle or position.
D— The position where the contact points open.

7520. Magneto breaker point opening relative to the position of the rotating magnet and distributor rotor (internal timing) can be set most accurately

A— after magneto-to-engine timing has been completed.
B— during the magneto-to-engine timing operation, with subsequent in-service readjustment as a result of wear and pitting.
C— during assembly of the magneto before installation on the engine.
D— by setting the points roughly at the required clearance before installing the magneto and then making the fine breaker point adjustment after installation to compensate for wear in the magneto drive train.

7521. Why are high-tension ignition cables frequently routed from the distributors to the spark plugs in flexible metallic conduits?

A— To eliminate high altitude flashover.
B— To reduce the formation of corona and nitric oxide on the cable insulation.
C— To reduce the effect of the high-frequency electromagnetic waves emanated during operation.
D— To decrease the resistance of the current return path (ground).

7522. What will be the results of increasing the gap of the breaker points in a magneto?

A— Retard the spark and increase its intensity.
B— Advance the spark and decrease its intensity.
C— Retard the spark and decrease its intensity.
D— Advance the spark and increase its intensity.

7523. What is the purpose of a safety gap in some magnetos?

A— To discharge the secondary coil's voltage if an open occurs in the secondary circuit.
B— To ground the magneto when the ignition switch is off.
C— To keep the magneto from delivering a spark until it reaches its coming-in speed.
D— To prevent flashover in the distributor.

7524. When timing a magneto internally, the alignment of the timing marks indicates that the

A— breaker points are just closing.
B— magnets are in the neutral position.
C— magnets are in the E-gap position.
D— breaker points are open to their widest gap.

7525. When internally timing a magneto, the breaker points begin to open when the rotating magnet is

A— in the neutral position.
B— fully aligned with the pole shoes.
C— a few degrees past full alignment with the pole shoes.
D— a few degrees past the neutral position.

7526. What is the electrical location of the primary condenser in a high-tension magneto?

A— Across the ignition switch.
B— Across the breaker points.
C— In series with the breaker points.
D— Between the ignition switch and the breaker points.

7527. In a high-tension ignition system, the current in the magneto secondary winding is

A— conducted from the primary winding via the discharge of the condenser.
B— conducted from the primary by the counter emf developed across the condenser.
C— induced when the primary circuit is interrupted.
D— induced when the primary circuit discharges via the breaker points.

7528. When a "Shower of Sparks" ignition system is activated at an engine start, a spark plug fires

A— as soon as the retard breaker points close.
B— as soon as the advance breaker points open.
C— only while both the retard and advance breaker points are closed.
D— only while both the retard and advance breaker points are open.

7529. What is the radial location of the two north poles of a four-pole rotating magnet in a high-tension magneto?

A— 180° apart.
B— 270° apart.
C— 90° apart.
D— 45° apart.

7530. Magneto pole shoes are generally made of

A— laminations of high-grade soft iron.
B— laminations of high-grade Alnico.
C— strips of extremely hard steel.
D— pieces of high-carbon iron.

7531. Capacitance afterfiring in most modern spark plugs is reduced by the use of

A— massive electrodes.
B— fine wire electrodes.
C— a built-in resistor in each plug.
D— aluminum oxide insulation.

7532. What component(s) make(s) up the magnetic system of a magneto?

A— Pole shoes, the pole shoe extensions, and the primary coil.
B— Primary and secondary coils.
C— Rotating magnet, the pole shoes, the pole shoe extensions, and the coil core.
D— Rotating magnet.

7533. In an aircraft ignition system, one of the functions of the condenser is to

A— regulate the flow of current between the primary and secondary coil.
B— facilitate a more rapid collapse of the magnetic field in the primary coil.
C— stop the flow of magnetic lines of force when the points open.
D— act as a safety gap for the secondary coil.

7534. When will the voltage in the secondary winding of a magneto, installed on a normally operating engine, be at its highest value?

A— During the power stroke at the point of greatest cylinder pressure.
B— Just prior to spark plug firing.
C— Toward the latter part of the spark duration when the flame front reaches its maximum velocity.
D— Immediately after the breaker points close.

7535. When the switch is off in a battery ignition system, what happens to the primary circuit?

A— A high resistance is connected in series with the primary.
B— The primary circuit is grounded.
C— The primary circuit is opened.
D— The primary circuit is shorted.

7536. As an aircraft engine's speed is increased, the voltage induced in the primary coil of the magneto

A— remains constant.
B— increases.
C— varies with the setting of the voltage regulator.
D— decreases.

7537. When internally timing a magneto, the breaker points begin to open when

A— the piston has just passed TDC at the end of the compression stroke.
B— the resultant flux flow is zero.
C— the magnet poles are a few degrees beyond the neutral position.
D— the magnet poles are fully aligned with the pole shoes.

7538. On a nine-cylinder radial engine, the spark plug wire from the No. 6 distributor block electrode would go to cylinder

A— No. 4.
B— No. 6.
C— No. 8.
D— No. 2.

7539. A safety gap in a magneto is for what purpose?

A— To prevent burning out the primary winding.
B— To protect the high-voltage winding from damage.
C— To prevent arcing across spark plug electrodes.
D— To prevent burning of contact points.

7540. On a seven-cylinder radial engine, No. 3 distributor wire is connected to what cylinder?

A— No. 1.
B— No. 7.
C— No. 5.
D— No. 3.

7541. A defective primary condenser in a magneto is indicated by

A— broken breaker points.
B— a fine-grained frosted appearance of the breaker points.
C— burned and pitted breaker points.
D— a weak spark.

7542. How many secondary coils are required in a low-tension ignition system on an 18-cylinder engine?

A— 36.
B— 4.
C— 18.
D— 9.

7543. A magneto ignition switch is connected

A— in series with the breaker points.
B— in series with both the breaker points and the primary condenser.
C— parallel to the breaker points.
D— in series with the primary condenser and parallel to the breaker points.

7544. The spark is produced in a magneto ignition system when the breaker points are

A— beginning to close.
B— fully open.
C— beginning to open.
D— fully closed.

7545. Shielding is used on spark plug and ignition wires to

A— prevent leakage of current which results in a weak spark.
B— protect the wires from short circuits as a result of chafing and rubbing.
C— protect the wires from oil and grease.
D— prevent interference with radio reception.

7546. What is the purpose of using an impulse coupling with a magneto?

A— To absorb impulse vibrations between the magneto and the engine.
B— To compensate for backlash in the magneto and the engine gears.
C— To produce a momentary high rotational speed of the magneto.
D— To prevent the magneto speed from fluctuating at high engine speeds.

7547. The purpose of staggered ignition is to compensate for

A— long ignition harness.
B— short ignition harness.
C— rich fuel/air mixture around exhaust valve.
D— diluted fuel/air mixture around exhaust valve.

7548. Aircraft magneto housings are usually ventilated in order to

A— prevent the entrance of outside air which may contain moisture.
B— allow heated air from the accessory compartment to keep the internal parts of the magneto dry.
C— provide cooling and remove corrosive gases produced by normal arcing.
D— allow excess lubricating oil to drain from the housing.

7549. Failure of an engine to cease firing after turning the magneto switch off is an indication of

A— a grounded magneto lead.
B— an open in the low-tension lead to ground.
C— a grounded condenser.
D— a grounded magneto switch.

7550. Alignment of the marks provided for internal timing of a magneto indicates that the

A— breaker points are just beginning to close for No. 1 cylinder.
B— magneto is in E-gap position.
C— No. 1 cylinder is on TDC of compression stroke.
D— magnet poles are a few degrees before neutral.

7551. When using a timing light to time a magneto to an aircraft engine, the magneto switch should be placed in the

A— BOTH position.
B— OFF position.
C— LEFT position.
D— RIGHT position.

7552. What is the difference between a low-tension and a high-tension engine ignition system?

A— A low-tension system produces relatively low voltage at the spark plug as compared to a high-tension system.
B— A low-tension system does not require any high-voltage ignition leads, but a high-tension system requires all leads to transmit high voltage.
C— A high-tension system is designed for high-altitude aircraft, while a low-tension system is for low- to medium-altitude aircraft.
D— A low-tension system uses a transformer coil near the spark plugs to boost voltage, while the high-tension system voltage is constant from the magneto to the spark plugs.

7553. What test instrument could be used to test a high-tension ignition harness for suspected leakage?

A— A micro-ammeter.
B— A dc voltmeter.
C— An ac voltmeter.
D— A dc ammeter.

7554. The amount of voltage generated in any magneto secondary coil is determined by the number of windings and by

A— the rate of buildup of the magnetic field around the primary coil.
B— the rate of collapse of the magnetic field around the primary coil.
C— the amount of charge stored by the capacitor.
D— the amount of charge released by the capacitor.

7555. Magneto breaker points must be timed to open when the

A— rotating magnet is positioned a few degrees before neutral.
B— greatest magnetic field stress exists in the magnetic circuit.
C— least magnetic field stress exists in the magnetic circuit.
D— rotating magnet is in the full register position.

7556. In reference to a "Shower of Sparks" ignition system,

(1) the retard breaker points are designed to keep the affected ignition system operating if the advance breaker points should fail during normal engine operation (after start).

(2) the timed opening of the retard breaker points is designed to prevent engine "kickback" during start.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7557. The capacitor-type ignition system is used almost universally on turbine engines primarily because of its high voltage and

A— low amperage.
B— long life.
C— low-temperature range.
D— high-heat intensity.

7558. In a low-tension ignition system, each spark plug requires an individual

A— condenser.
B— cam assembly.
C— breaker assembly.
D— secondary coil.

7559. A certain nine-cylinder radial engine used a noncompensated single-unit, dual-type magneto with a four-pole rotating magnet and separately mounted distributors. Which of the following will have the lowest RPM at any given engine speed?

A— Breaker cam.
B— Engine crankshaft.
C— Distributors.
D— Rotating magnet.

7560. What will be the effect if the spark plugs are gapped too wide?

A— Insulation failure.
B— Hard starting.
C— Shell breakdown.
D— Lead damage.

7561. When removing a shielded spark plug, which of the following is most likely to be damaged?

A— Center electrode.
B— Shell section.
C— Ground electrodes.
D— Core insulator.

7562. What likely effect would a cracked distributor rotor have on a magneto?

A— Ground the secondary circuit through the crack.
B— Fire the trailing cylinder.
C— Fire two cylinders simultaneously.
D— Ground the primary circuit through the crack.

7563. How does the ignition system of a gas turbine engine differ from that of a reciprocating engine?

A— One igniter plug is used in each combustion chamber.
B— Low energy igniter plugs are used in place of spark plugs.
C— Magneto-to-engine timing is not critical.
D— A high-energy spark is required for ignition.

7564. In a turbine engine dc capacitor discharge ignition system, where are the high-voltage pulses formed?

A— At the breaker.
B— At the triggering transformer.
C— At the rectifier.
D— At the multilobe cam.

7565. Which of the following breaker point characteristics is associated with a faulty condenser?

A— Oily.
B— Crowned.
C— Fine grained.
D— Coarse grained.

7566. How are most radial engine spark plug wires connected to the distributor block?

A— By use of cable-piercing screws.
B— By use of self-locking cable ferrules.
C— By use of terminal sleeves and retaining nuts.
D— By friction between the cable ferrule and distributor block well.

7567. Thermocouples are usually inserted or installed on the

A— coldest cylinder of the engine.
B— front cylinder of the engine.
C— rear cylinder of the engine.
D— hottest cylinder of the engine.

7568. Capacitance afterfiring of a spark plug is caused by

A— the stored energy in the ignition shielded lead unloading after normal timed ignition.
B— excessive center electrode erosion.
C— constant polarity firing.
D— alternate polarity firing.

7569. If it is found that a shielded ignition system does not adequately reduce ignition noise, it may be necessary to install

A— bonding wires across the shielding connections.
B— a second layer of shielding.
C— a filter between the magneto and magneto switch.
D— bonding wires from the shielding to ground.

7570. A test of a reciprocating engine ignition harness revealed excessive leakage in a majority of the leads. What is a probable cause?

A— An improper ground of lead shielding.
B— A shorted primary coil in the magneto.
C— A deteriorated condition of the distributor block.
D— Improper spark plug gap.

7571. Why are turbine engine igniters less susceptible to fouling than reciprocating engine spark plugs?

A— The high-intensity spark cleans the igniter with heat.
B— The frequency of the spark is less for igniters.
C— Turbine igniters operate cooler.
D— Turbine fuel does not contain igniter contaminates.

7572. The constrained-gap igniter plug used in some gas turbine engines operates at a cooler temperature because

A— it projects into the combustion chamber.
B— the applied voltage is less.
C— the construction is such that the spark occurs beyond the face of the combustion chamber liner.
D— it has multiple electrodes to share the voltage arcing.

7573. What should be used to clean grease or carbon tracks from condensers or coils that are used in magnetos?

A— Solvent.
B— Acetone.
C— Soap and water.
D— Naphtha.

7574. Generally, when removing a turbine engine igniter plug, in order to eliminate the possibility of the technician receiving a lethal shock, the ignition switch is turned off and

A— disconnected from the power supply circuit.
B— insulating rubber gloves should be worn while removing or installing igniter plugs.
C— the igniter lead is disconnected from the plug and the center electrode grounded to the engine after disconnecting the transformer-exciter input lead and waiting the prescribed time.
D— the transformer-exciter input lead is disconnected and the center electrode grounded to the engine after disconnecting the igniter lead from the plug and waiting the prescribed time.

7575. Great caution should be exercised in handling damaged hermetically sealed turbine engine igniter transformer units because

A— compounds in the unit may become a fire or explosion hazard when exposed to the air.
B— of the possibility of static electricity sparking across electrical components.
C— some contain radioactive material.
D— some contain toxic chemicals.

7576. Igniter plugs used in turbine engines are subjected to high intensity spark discharges and yet they have a long service life because they

A— operate at much lower temperatures.
B— have a much smaller electrode gap.
C— are not placed directly into the combustion chamber.
D— do not require continuous operation.

7577. The electrical circuit from the spark plug back to the magneto is completed by

A— grounding through the engine structure.
B— grounding through the aircraft's electrical power system.
C— grounding through the spark plug lead shielding.
D— a ground wire through the cockpit switch.

7578. Spark plugs are considered worn out when

A— the electrodes have worn away to about one-half of their original dimensions.
B— there are light brown or tan deposits on the nose of the center electrode insulator.
C— the center electrode edges have become rounded.
D— the electrodes have worn away to about two-thirds of their original dimensions.

7579. Which of the following will cause the center electrode insulator of ceramic spark plugs to fracture and/or break?

A— Improper timing.
B— Electrical erosion.
C— Improper gapping procedures.
D— Excessive magneto voltage.

7580. Sharp bends should be avoided in ignition leads primarily because

A— weak points may develop in the insulation through which high tension current can leak.
B— moisture may enter through the stressed insulation.
C— ignition lead wire conductor material is brittle and may break.
D— ignition lead shielding effectiveness will be reduced.

7581. The sparking order of a distributor used on a nine-cylinder radial engine is

A— 1, 3, 5, 7, 9, 2, 4, 6, and 8.
B— 1, 3, 2, 5, 7, 4, 6, 9, and 8.
C— 1, 2, 4, 6, 8, 3, 5, 9, and 7.
D— 1, 2, 3, 4, 5, 6, 7, 8, and 9.

7582. In a high-tension ignition system, a primary condenser of too low a capacity will cause

A— excessive primary voltage.
B— excessively high secondary voltage.
C— the breaker contacts to burn.
D— excessive burning of the spark plug electrodes.

7583. Which of the following, obtained during magneto check at 1,700 RPM, indicates a short (grounded) circuit between the right magneto primary and the ignition switch?

A— BOTH—1,700 RPM,
R—1,625 RPM,
L—1,700 RPM,
OFF—1,625 RPM.
B— BOTH—1,700 RPM,
R—0 RPM,
L—1,700 RPM,
OFF—0 RPM.
C— BOTH—1,700 RPM,
R—1,625 RPM,
L—1,675 RPM,
OFF—1,625 RPM.
D— BOTH—1,700 RPM,
R—0 RPM,
L—1,675 RPM,
OFF—0 RPM.

7584. If an aircraft ignition switch is turned off and the engine continues to run normally, the trouble is probably caused by

A— a leak in the carburetor.
B— an open ground lead in the magneto.
C— arcing magneto breaker points.
D— failure to turn off the battery switch.

7585. Where are the breaker points located in a typical low-tension ignition system of an 18-cylinder radial engine used on a certificated aircraft?

A— In the magneto, and each set of points is associated with a transformer.
B— In the distributors, and are actuated by four compensating cams.
C— In the magneto, and are actuated by one 18-lobe compensating cam.
D— In the distributor, and each set of points is associated with 18 transformers.

7586. Which statement is correct regarding the ignition system of a turbine engine?

A— The system is normally de-energized as soon as the engine starts.
B— It is a low-voltage, low-amperage system.
C— It is energized during the starting and warmup periods only.
D— The system generally includes a polar inductor-type magneto.

7587. When the ignition switch of a single (reciprocating) engine aircraft is turned to the OFF position,

A— the primary circuits of both magnetos are grounded.
B— the secondary circuits of both magnetos are opened.
C— all circuits are automatically opened.
D— the high-tension lead from the battery is grounded.

7588. On a double-row radial engine when the ignition switch is on LEFT,

A— all plugs in the front row are firing.
B— all plugs in the rear row are firing.
C— the front plugs of both rows are firing.
D— the rear plugs of both rows are firing.

7589. A spark plug's heat range is the result of its specific design, and therefore

A— the area of the plug exposed to the cooling airstream.
B— its ability to transfer heat from the firing end of the spark plug to the cylinder head.
C— the area of the plug terminal.
D— the heat intensity of the spark.

7590. What will be the result if the secondary winding in a low-tension ignition coil fails?

A— One spark plug will fail to fire.
B— All plugs will fail to fire.
C— One row of plugs (front or rear) will fail to fire.
D— One set (both plugs in one cylinder) will fail to fire.

7591. If staggered ignition timing is used, the

A— spark plug nearest the exhaust valve will fire first.
B— spark will be automatically retarded as engine speed increases.
C— spark will be automatically advanced as engine speed increases.
D— spark plug nearest the intake valve will fire first.

7592. The term "reach," as applied to spark plug design and/or type, indicates

A— the length of the center electrode insulation exposed to the flame of combustion.
B— the linear distance from the shell gasket seat to the end of the shell skirt.
C— the length of center electrode exposed to the flame of combustion.
D— the length of the shielded barrel.

7593. The numbers appearing on the ignition distributor block indicate the

A— sparking order of the distributor.
B— relation between distributor terminal numbers and cylinder numbers.
C— ratio of the distributor rotor speed to the crankshaft speed.
D— firing order of the engine.

7594. When testing a magneto distributor block for electrical leakage, which of the following pieces of test equipment should be used?

A— A high-tension harness tester.
B— A condenser tester.
C— A continuity tester.
D— A high-range ammeter.

7595. (1) The platinum and iridium ground electrodes used on fine wire spark plugs are extremely brittle and can be broken if they are improperly handled or adjusted.

(2) When gapping massive-electrode spark plugs, a wire gauge should be inserted between the center and ground electrodes while moving the ground electrode in order to avoid setting the gap too close.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7596. Compensated timing provides for the firing of the cylinders

A— at the position of crankshaft travel that provides the balance between the inertia of the reciprocating mass and the force that results from compressing the fuel/air charge.
B— at the piston position which produces peak compression regardless of the degree of crankshaft travel required to obtain the position.
C— an equal number of degrees of crankshaft travel apart regardless of variations in piston position caused by articulation of the connecting rod assembly.
D— in relationship to piston position regardless of variations in crankshaft travel required to obtain the position.

7597. Proper heat range selection of spark plugs is one that allows the insulator nose cores to operate most of the time between

A— 900 and 1300 °F.
B— 600 and 900 °F.
C— 1300 and 1500 °F.
D— 500 and 700 °F.

7598. Hot spark plugs are generally used in aircraft powerplants

A— with comparatively high compression or high operating temperatures.
B— with comparatively low operating temperatures.
C— which are loosely baffled.
D— which produce high power per cubic inch displacement.

7599. If a spark plug lead becomes grounded, the

A— magneto secondary winding will become overloaded and break down.
B— magneto will not be affected.
C— distributor rotor finger will discharge to the next closest electrode within the distributor.
D— condenser will break down.

7600. Which of the following statements regarding magneto switch circuits is NOT true?

A— In the BOTH position, the right and left magneto circuits are grounded.
B— In the OFF position, neither the right nor left magneto circuits are open.
C— In the RIGHT position, the right magneto circuit is open and the left magneto circuit is grounded.
D— In the LEFT position, the left magneto circuit is open and the right magneto circuit is grounded.

7601. Which of the following statements most accurately describes spark plug heat range?

A— The length of the threaded portion of the shell usually denotes the spark plug heat range.
B— A hot plug is designed so that the insulator tip is reasonably short to hasten the rate of heat transfer from the tip through the spark plug shell to the cylinder head.
C— A cold plug is designed so that the insulator tip is reasonably short to hasten the rate of heat transfer from the tip through the spark plug shell to the cylinder head.
D— Shielded spark plugs have a much higher heat range than nonshielded spark plugs.

7602. When does battery current flow through the primary circuit of a battery ignition coil?

A— Only when a spark plug is firing.
B— Only when the breaker points are open.
C— At all times when the ignition switch is on.
D— When the breaker points are closed and the ignition switch is on.

7603. In order to turn a magneto off, the primary circuit must be

A— shunted to the battery circuit.
B— grounded.
C— opened.
D— shorted.

7604. When performing a magneto ground check on an engine, correct operation is indicated by

A— a decrease in manifold pressure.
B— an increase in RPM.
C— no drop in RPM.
D— a slight drop in RPM.

7605. Defective spark plugs will cause

A— intermittent missing of the engine at high speeds only.
B— intermittent missing of the engine at low speeds only.
C— failure of the magneto.
D— intermittent missing of the engine at all speeds.

7606. A spark plug is fouled when

A— its gap is too small.
B— its magneto wire is not connected.
C— it causes preignition.
D— its spark grounds without jumping electrodes.

7607. Which of the following would be cause for rejection of a spark plug?

A— Carbon fouling of the electrode and insulator.
B— Insulator tip cracked.
C— Center electrode being a light gray color.
D— Lead fouling of the electrode and insulator.

7608. What will be the result of using too hot a spark plug?

A— Failure of the engine.
B— Fouling of plug.
C— Preignition.
D— Burned condenser.

7609. Upon inspection of the spark plugs in an aircraft engine, the plugs were found caked with a heavy black soot. This indicates

A— worn oil seal rings.
B— a rich mixture.
C— a lean mixture.
D— improper spark plug gap setting.

7610. Spark plug heat range is determined by

A— the reach of the spark plug.
B— its ability to transfer heat to the cylinder head.
C— the number of ground electrodes.
D— outside air temperature.

7611. Ignition check during engine runup indicates excessive RPM drop during operation on the right magneto. The major portion of the RPM loss occurs rapidly after switching to the right magneto position (fast drop). The most likely cause is

A— faulty or fouled spark plugs.
B— incorrect ignition timing on both magnetos.
C— incorrect valve timing.
D— one or more dead cylinders.

7612. If new breaker points are installed in a magneto on an engine, it will be necessary to time the

A— magneto internally and the magneto to the engine.
B— breaker points to the No. 1 cylinder.
C— magneto drive to the engine.
D— distributor gear to the magneto drive.

7613. Using a cold spark plug in a high-compression aircraft engine would probably result in

A— normal operation.
B— preignition.
C— a fouled plug.
D— detonation.

7614. Spark plug fouling caused by lead deposits

A— occurs most often during cruise with rich mixture.
B— occurs most often when cylinder head temperatures are relatively low.
C— may best be corrected by increasing engine RPM to burn away the lead deposits.
D— occurs most often when cylinder head temperatures are high.

7615. In a four-stroke cycle aircraft engine, when does the ignition event take place?

A— After the piston reaches TDC on intake stroke.
B— Before the piston reaches TDC on compression stroke.
C— After the piston reaches TDC on power stroke.
D— After the piston reaches TDC on compression stroke.

7616. When installing a magneto on an engine, the

A— rotating magnet of the magneto must not be in the E-gap position.
B— piston in the No. 1 cylinder must be a prescribed number of degrees before top center on the compression stroke.
C— magneto breaker points must be just closing.
D— piston in the No. 1 cylinder must be a prescribed number of degrees after top center on the intake stroke.

7617. The spark occurs at the spark plug when the ignition's

A— secondary circuit is broken.
B— secondary circuit is completed.
C— primary circuit is completed.
D— primary circuit is broken.

7618. The type of ignition system used on most turbine aircraft engines is

A— high resistance.
B— magneto.
C— low tension.
D— capacitor discharge.

7619. Ignition check during engine runup indicates a slow drop in RPM. This is usually caused by

A— defective spark plugs.
B— a defective high-tension lead.
C— incorrect ignition timing or valve adjustment.
D— distributor points too wide.

7620. If the ground wire of a magneto is disconnected at the ignition switch, the result will be

A— the affected magneto will be isolated and the engine will run on the opposite magneto.
B— a decrease in magnetic lines of force.
C— the engine will stop running.
D— the engine will not stop running when the ignition switch is turned off.

7621. Which of the following are advantages of dual ignition in aircraft engines?

1. Gives a more complete and quick combustion of the fuel.
2. Provides a backup magneto system.
3. Increases the output power of the engine.
4. Permits the use of lower grade fuels.
5. Increases the intensity of the spark at the spark plugs.

A— 2, 3, 4.
B— 3, 4, 5.
C— 2, 3, 5.
D— 1, 2, 3.

7622. How does high-tension ignition shielding tend to reduce radio interference?

A— Prevents ignition flashover at high altitudes.
B— Protects the ignition leads against the entrance of moisture and subsequent electrical leakage.
C— Reduces voltage drop in the transmission of high-tension current.
D— Receives and grounds high-frequency waves coming from the magneto and high-tension ignition leads.

7623. Which of the following are distinct circuits of a high-tension magneto?

1. Magnetic.
2. Primary.
3. E-gap.
4. P-lead.
5. Secondary.

A— 1, 2, 5.
B— 1, 3, 4.
C— 2, 4, 5.
D— 2, 3, 4.

7624. What are two parts of a distributor in an aircraft engine ignition system?

1. Coil.
2. Block.
3. Stator.
4. Rotor.
5. Transformer.

A— 2 and 4.
B— 1 and 3.
C— 3 and 4.
D— 2 and 5.

7625. What is a result of "flashover" in a distributor?

A— Intense voltage at the spark plug.
B— Reversal of current flow.
C— Erosion of the cigarette.
D— Conductive carbon trail.

7626. What is the relationship between distributor and crankshaft speed of aircraft reciprocating engines?

A— The distributor turns at crankshaft speed.
B— The distributor turns at one-half crankshaft speed.
C— The distributor turns at one and one-half crankshaft speed.
D— The crankshaft turns at one-half distributor speed.

7627. Why do turbine engine ignition systems require high energy?

A— To ignite the fuel under conditions of high altitude and high temperatures.
B— Because the applied voltage is much greater.
C— To ignite the fuel under conditions of high altitude and low temperatures.
D— Because the applied voltage is much less.

7628. Which of the following are included in a typical turbine engine ignition system?

1. Two exciter units.
2. One exciter unit.
3. Two transformers.
4. Two intermediate ignition leads.
5. Two low-tension leads.
6. Two high-tension leads.
7. One transformer.

A— 2, 3, 4, 5.
B— 1, 4, 5, 7.
C— 1, 4, 6, 7.
D— 1, 3, 4, 6.

7629. At what RPM is a reciprocating engine ignition switch check made?

A— 1,500 RPM.
B— The slowest possible RPM.
C— Full throttle RPM.
D— Cruise RPM.

7630. What is the approximate position of the rotating magnet in a high-tension magneto when the points first close?

A— Full register.
B— Neutral.
C— E-gap.
D— A few degrees after neutral.

7631. What component of a dual magneto is shared by both ignition systems?

A— Breaker points.
B— High-tension coil.
C— Rotating magnet.
D— Capacitor.

7632. What would be the result if a magneto breaker point mainspring did not have sufficient tension?

A— The points will stick.
B— The points will not open to the specified gap.
C— The points will float or bounce.
D— A greater than normal induction buildup of the magneto.

7633. The secondary coil of a magneto is grounded through the

A— ignition switch.
B— grounded side of the primary condenser.
C— primary coil.
D— grounded side of the breaker points.

7634. In the aircraft magneto system, if the P-lead is disconnected, the magneto

A— will only produce a weak spark.
B— will be "hot" (ON) regardless of ignition switch position.
C— will be grounded regardless of ignition switch position.
D— timing will be altered.

7635. A carburetor is equipped with a derichment valve and a derichment jet which adds a cooling fluid. This is called

A— water evaporator additive.
B— an injection of water and freon.
C— atmosphere injection.
D— anti-detonant injection (ADI).

7636. When the water injection system on a turbine engine airplane contains water and is armed in the cockpit,

A— the water is turned on automatically when a predetermined EGT is reached.
B— the water injection system is turned on by a timer actuated by the power lever.
C— the water injection valves are opened by a switch on their respective power levers in the cockpit.
D— nothing happens until the outside air temperature exceeds 100 °F.

7637. The anti-detonant fluid used in reciprocating engine water injection systems is primarily a mixture of

A— benzine and water.
B— alcohol and water.
C— potassium dichromate and water.
D— ethylene glycol and water.

7638. If the water injection switch on a reciprocating engine is turned on when the engine is not operating, the derichment valve will

A— close because of water pressure.
B— open by means of an electric solenoid.
C— not actuate.
D— close if fuel pressure is available.

7639. In addition to permitting an increase in maximum manifold pressure, the water injection system permits the engine to

A— operate at METO power.
B— operate at maximum power for unlimited periods.
C— develop increased power without changing the manifold pressure and RPM settings.
D— increase the aircraft cruising range by replacing part of the fuel/air mixture with an anti-detonant.

7640. How does injection of a water solution during high-power output increase the available power of reciprocating engines?

A— By increasing the weight of charge.
B— By suppressing detonation.
C— By improving volumetric efficiency.
D— By increasing the burning rate of the fuel/air charge.

7641. What actuates the derichment valve in a pressure carburetor?

A— Throttle linkage.
B— Air pressure.
C— Water (ADI) pressure.
D— Fuel pressure.

7642. A reciprocating engine automatic mixture control responds to changes in air density caused by changes in

A— altitude or humidity.
B— altitude only.
C— altitude or temperature.
D— temperature or humidity.

7643. On a float-type carburetor, the purpose of the economizer valve is to

A— economize on the amount of fuel discharged into the induction system.
B— provide extra fuel for sudden acceleration of the engine.
C— maintain the leanest mixture possible during cruising best power.
D— provide a richer mixture and cooling at maximum power output.

7644. The fuel metering force of a conventional float-type carburetor in its normal operating range is the difference between the pressure acting on the discharge nozzle located within the venturi and the pressure

A— acting on the fuel in the float chamber.
B— of the fuel as it enters the carburetor.
C— of the air as it enters the venturi (impact pressure).
D— on the downstream or engine side of the throttle valve.

7645. If the main air bleed of a float-type carburetor becomes clogged, the engine will run

A— lean at rated power.
B— rich at rated power.
C— rich at idling.
D— lean at idling.

7646. Which method is commonly used to adjust the level of a float in a float-type carburetor?

A— Lengthening or shortening the float shaft.
B— Add or remove shims under the needle-valve seat.
C— Change the angle of the float arm pivot.
D— Add or remove float weights.

7647. As the density of air decreases with increased altitude, the automatic mixture control (AMC) unit on a pressure carburetor will cause the air metering force to

A— increase by restricting the flow of air from chamber B (boost venturi suction).
B— decrease by restricting the flow of air to chamber A (impact pressure).
C— increase by reducing the restriction to the flow of air to chamber A (impact pressure).
D— decrease by reducing the restriction to the flow of air from chamber B (boost venturi suction).

7648. What is the possible cause of an engine running rich at full throttle if it is equipped with a float-type carburetor?

A— Float level too low.
B— Clogged main air bleed.
C— Clogged atmospheric vent.
D— Restricted main metering fuel jet.

7649. One of the things a calibrated orifice in a main air bleed helps to accomplish (at a given altitude) in a carburetor is

A— pressure in the float chamber to increase as airflow through the carburetor increases.
B— pressure in the float chamber to decrease as airflow through the carburetor increases.
C— a progressively richer mixture as airflow through the carburetor increases.
D— a relatively constant fuel/air mixture ratio as airflow through the carburetor changes.

7650. A punctured float in a float-type carburetor will cause the fuel level to

A— lower, and enrich the mixture.
B— rise, and enrich the mixture.
C— rise, and lean the mixture.
D— lower, and lean the mixture.

7651. The back-suction mixture control system operates by

A— varying the pressure within the venturi section.
B— altering the height of the fuel in the float chamber.
C— varying the pressure acting on the fuel in the float chamber.
D— changing the effective cross-sectional area of the main metering orifice (jet).

7652. If an aircraft engine is equipped with a carburetor that is not compensated for altitude and temperature variations, the fuel/air mixture will become

A— leaner as either the altitude or temperature increases.
B— richer as the altitude increases and leaner as the temperature increases.
C— richer as either the altitude or temperature increases.
D— leaner as the altitude increases and richer as the temperature increases.

7653. Float-type carburetors which are equipped with economizers are normally set for

A— their richest mixture delivery and leaned by means of the economizer system.
B— the economizer system to supplement the main system supply at all engine speeds above idling.
C— economizer valves to be open at cruising speeds and closed at maximum RPM.
D— their leanest practical mixture delivery at cruising speeds and enriched by means of the economizer system at higher power settings.

7654. If a float-type carburetor becomes flooded, the condition is most likely caused by

A— a leaking needle valve and seat assembly.
B— a clogged main discharge nozzle.
C— the accelerating pump shaft being stuck.
D— a clogged back-suction line.

7655. If an engine is equipped with a float-type carburetor and the engine runs excessively rich at full throttle, a possible cause of the trouble is a clogged

A— main air bleed.
B— back-suction line.
C— atmospheric vent line.
D— main metering fuel jet.

7656. What occurs when a back-suction type mixture control is placed in IDLE CUTOFF?

A— The fuel passages to the main and idle jets will be closed by a valve.
B— The float chamber will be vented to a negative pressure area.
C— The fuel passage to the idle jet will be closed by a valve.
D— The fuel passage to the main jet will be closed by a valve.

7657. Which of the following best describes the function of an altitude mixture control?

A— Regulates the richness of the fuel/air charge entering the engine.
B— Regulates the air pressure above the fuel in the float chamber.
C— Regulates the air pressure in the venturi.
D— Regulates the main airflow to the engine.

7658. Select the correct statement concerning the idle system of a conventional float-type carburetor.

A— The low-pressure area created in the throat of the venturi pulls the fuel from the idle passage.
B— Climatic conditions have very little effect on idle mixture requirements.
C— The low pressure between the edges of the throttle valve and the throttle body pulls the fuel from the idle passage.
D— Airport altitude has very little effect on idle mixture requirements.

7659. On an engine equipped with a pressure-type carburetor, fuel supply in the idling range is ensured by the inclusion in the carburetor of

A— a separate fuel supply to the discharge nozzle that supplements normal carburetor fuel supply in the idle range.
B— a spring in the unmetered fuel chamber to supplement the action of normal metering forces.
C— an idle metering jet that bypasses the carburetor in the idle range.
D— a separate boost venturi that is sensitive to the reduced airflow at start and idle speeds.

7660. The economizer system of a float-type carburetor performs which of the following functions?

A— It supplies and regulates the fuel required for all engine speeds below cruising.
B— It supplies and regulates the fuel required for all engine speeds.
C— It supplies and regulates the additional fuel required for all engine speeds above cruising.
D— It regulates the fuel required for all engine speeds and all altitudes.

7661. How will the mixture of an engine be affected if the bellows of the automatic mixture control (AMC) in a pressure carburetor ruptures while the engine is operating at altitude?

A— It will become leaner.
B— No change will occur until the altitude changes.
C— No change will occur until the throttle setting is changed.
D— It will become richer.

7662. The fuel level within the float chamber of a properly adjusted float-type carburetor will be

A— slightly higher than the discharge nozzle outlet.
B— unrelated to the discharge nozzle outlet position.
C— slightly lower than the discharge nozzle outlet.
D— at the same level as the discharge nozzle outlet.

7663. How will the mixture of an engine be affected if the diaphragm between chambers A and B ruptures on a pressure carburetor for small engines?

A— It will become rich at all power settings.
B— It will become lean at all power settings.
C— It will become rich at low power settings.
D— It will become lean at low power settings.

7664. The metered fuel pressure (chamber C) in an injection-type carburetor

A— is held constant throughout the entire engine operating range.
B— varies according to the position of the poppet valve located between chamber D (unmetered fuel) and chamber E (engine-driven fuel pump pressure).
C— will be approximately equal to the pressure in chamber A (impact pressure).
D— varies in proportion to the mass airflow being handled by the carburetor.

7665. As the throttle of an engine equipped with a pressure injection carburetor is retarded, the pressure differential between air chambers A (regulated air inlet pressure) and B (boost venturi pressure) will

A— remain constant if the throttle is closed slowly.
B— decrease.
C— decrease momentarily, then increase to previous differential pressure.
D— increase momentarily, then decrease to previous differential pressure.

7666. Select the statement which is correct relating to a fuel level check of a float-type carburetor.

A— Do not use leaded gasoline.
B— Use 5 pounds fuel pressure for the test if the carburetor is to be used in a gravity fuel feed system.
C— Block off the main and idle jets to prevent a continuous flow of fuel through the jets.
D— Do not measure the level at the edge of the float chamber.

7667. Which statement regarding the air metering force in a pressure injection carburetor installed on a 14-cylinder engine is correct?

A— The air metering force opens the poppet valve according to the pressure drop in the boost venturi and the pressure of the air picked up by the impact tubes.
B— The air metering force is balanced solely by the fuel metering force during all operation from idling to full power.
C— The air metering force is modified by the operation of the manual mixture control.
D— The air metering force is assisted by the idle spring which holds the poppet valve open during high RPM operation.

7668. What carburetor component measures the amount of air delivered to the engine?

A— Economizer valve.
B— Automatic mixture control.
C— Cloverleaf.
D— Venturi.

7669. The automatic mixture control on a pressure carburetor controls the fuel/air mixture by directly controlling the

A— air volume through the venturi.
B— fuel pressure in chamber E.
C— nozzle discharge orifice.
D— air metering force.

7670. If a float-type carburetor leaks fuel when the engine is stopped, a likely cause is that the

A— float needle valve is worn or otherwise not seated properly.
B— float level is adjusted too low.
C— economizer valve is open.
D— main air bleed is clogged.

7671. Fuel is discharged for idling speeds on a float-type carburetor

A— through the main discharge nozzle.
B— from the idle discharge nozzle.
C— in the venturi.
D— through the idle discharge air bleed.

7672. When air passes through the venturi of a carburetor, what three changes occur?

A— Velocity increases, temperature increases, and pressure decreases.
B— Velocity decreases, temperature decreases, and pressure decreases.
C— Velocity decreases, temperature increases, and pressure increases.
D— Velocity increases, temperature decreases, and pressure decreases.

7673. Where is the throttle valve located on a float-type carburetor?

A— Between the venturi and the discharge nozzle.
B— After the main discharge nozzle and venturi.
C— Before the venturi, but after the butterfly valve.
D— After the venturi and just before the main discharge nozzle.

7674. An aircraft carburetor is equipped with a mixture control in order to prevent

A— ice formation in the carburetor.
B— the mixture from becoming too lean at high altitudes.
C— the mixture from becoming too rich at high altitudes.
D— the mixture from becoming too rich at high speeds.

7675. Which of the following is not a function of the carburetor venturi?

A— Proportions the air/fuel mixture.
B— Decreases pressure at the discharge nozzle.
C— Regulates the idle system.
D— Limits the airflow at full throttle.

7676. Idle cutoff is accomplished on a carburetor equipped with a back-suction mixture control by

A— introducing low pressure (intake manifold) air into the float chamber.
B— manually raising the float.
C— turning the fuel selector valve to OFF.
D— the positive closing of a needle and seat.

7677. The primary purpose of an air bleed in a float-type carburetor is to

A— aid fuel vaporization and control fuel discharge.
B— meter air to adjust the mixture.
C— decrease fuel density and destroy surface tension.
D— vent the back-suction mixture control.

7678. To determine the float level in a float-type carburetor, a measurement is usually made from the top of the fuel in the float chamber to the

A— parting surface of the carburetor.
B— top of the float.
C— bottom of the float chamber.
D— centerline of the main discharge nozzle.

7679. The throttle valve of float-type aircraft carburetors is located

A— ahead of the venturi and main discharge nozzle.
B— after the main discharge nozzle and ahead of the venturi.
C— between the venturi and the engine.
D— after the venturi and ahead of the main discharge nozzle.

7680. Which statement relative to the automatic mixture control (AMC) is true?

A— The AMC is placed in series with the venturi.
B— The AMC is placed in parallel with the boost venturi.
C— The AMC compensates for changes in air density thereby enabling the proper amount of fuel to be delivered.
D— An increase in air density results in a decrease of airflow through the boost venturi.

7681. Why must a float-type carburetor supply a rich mixture during idle?

A— The spark available for ignition during low RPM will not ignite a normal mixture.
B— Engine operation at idle results in higher than normal volumetric efficiency.
C— Because at idling speeds the engine may not have enough airflow around the cylinders to provide proper cooling.
D— Because of reduced mechanical efficiency during idle.

7682. What component is used to ensure fuel delivery during periods of rapid engine acceleration?

A— Acceleration pump.
B— Standby carburetor.
C— Water injection pump.
D— Power enrichment unit.

7683. The device that controls the ratio of the fuel/air mixture to the cylinders is called

A— a throttle valve.
B— a mixture control.
C— an acceleration pump.
D— a metering jet.

7684. The device that controls the volume of the fuel/air mixture to the cylinders is called

A— an acceleration pump.
B— a mixture control.
C— a metering jet.
D— a throttle valve.

7685. Which statement is correct regarding a continuous-flow fuel injection system used on some reciprocating engines?

A— Fuel is injected directly into each cylinder.
B— Fuel is injected at each cylinder intake port.
C— The injection system must be timed to the engine.
D— Two injector nozzles are used in the injector fuel system for various speeds.

7686. During the operation of an aircraft engine, the pressure drop in the carburetor venturi depends primarily upon the

A— air temperature.
B— barometric pressure.
C— air velocity.
D— humidity.

7687. The diaphragm acceleration pump used with an injection carburetor is discharged by

A— a sudden drop in pressure downstream of the throttle valve.
B— suitable linkage connected to the throttle shaft.
C— a sudden rise in pressure downstream of the throttle valve.
D— suitable linkage connected to the fuel-metering head enrichment valve.

7688. Which of the following causes a single diaphragm accelerator pump to discharge fuel?

A— An increase in venturi suction when the throttle valve is open.
B— An increase in manifold pressure that occurs when the throttle valve is opened.
C— A decrease in manifold pressure that occurs when the throttle valve is opened.
D— A decrease in pressure differential acting on the fuel metering orifices (jets) when the throttle valve is opened.

7689. At what engine speed does the main metering jet actually function as a metering jet in a float-type carburetor?

A— All RPM's.
B— Cruising RPM only.
C— Maximum RPM only.
D— All RPM's above idle range.

7690. An aircraft engine continuous cylinder fuel injection system normally discharges fuel during which stroke(s)?

A— Intake.
B— Compression.
C— Intake and compression.
D— All (continuously).

7691. What is the purpose of the carburetor accelerating system?

A— Supply and regulate the fuel required for engine speeds above idle.
B— Temporarily enrich the mixture when the throttle is suddenly opened.
C— Supply and regulate additional fuel required for engine speeds above cruising.
D— Temporarily derich the mixture when the throttle is suddenly closed.

7692. When changing a float-type carburetor removed from a 150-horsepower engine for use with a 180-horsepower engine, which of the following components would probably require change?

A— Venturi.
B— Float.
C— Throttle valve.
D— Needle-valve and seat assembly.

7693. In order to stabilize cams, springs, and linkages within the fuel control, manufacturers generally recommend that all final turbine engine trim adjustments be made

A— in the increase direction.
B— in the decrease direction.
C— in the decrease direction after over-adjustment.
D— without throttle cushion.

7694. What is the relationship between the accelerating pump and the enrichment valve in a pressure injection carburetor?

A— No relationship since they operate independently.
B— Fuel pressure affects both units.
C— The accelerating pump actuates the enrichment valve.
D— The mixture control changes the setting of each unit.

7695. What is the relationship between the pressure existing within the throat of a venturi and the velocity of the air passing through the venturi?

A— There is no direct relationship between the pressure and the velocity.
B— The pressure is proportional to the square of the velocity.
C— The pressure is directly proportional to the velocity.
D— The pressure is inversely proportional to the velocity.

7696. Which of the following is least likely to occur during operation of an engine equipped with a direct cylinder fuel injection system?

A— Torching.
B— Afterfiring.
C— Kickback during start.
D— Backfiring.

7697. What carburetor component actually limits the desired maximum airflow to the engine at full throttle?

A— Throttle valve.
B— Venturi.
C— Manifold intake.
D— Air diaphragm.

7698. On a carburetor without an automatic mixture control as you ascend to altitude, the mixture will

A— be enriched.
B— be leaned.
C— remain at the same ratio.
D— not be affected.

7699. During engine operation, if carburetor heat is applied, it will

A— increase air to fuel ratio.
B— decrease carburetor air temperature.
C— increase engine RPM.
D— decrease the air density to the carburetor.

7700. The desired engine idle speed and mixture setting

A— is adjusted with engine warmed up and operating.
B— should give minimum RPM with maximum manifold pressure.
C— is usually adjusted in the following sequence; speed first, then mixture.
D— is adjusted with the throttle advanced.

7701. A nine-cylinder radial engine, using a multiple-point priming system with a central spider, will prime which cylinders?

A— One, two, three, eight, and nine.
B— All cylinders.
C— Top three cylinders.
D— One, three, five, and seven.

7702. What is a function of the idling air bleed in a float-type carburetor?

A— It provides a means for adjusting the mixture at idle speeds.
B— It vaporizes the fuel at idling speeds.
C— It provides a means for adjusting the idle speed.
D— It aids in emulsifying the fuel at idle speeds.

7703. If the volume of air passing through a carburetor venturi is reduced, the pressure at the venturi throat will

A— decrease.
B— be equal to the pressure at the venturi inlet.
C— be equal to the pressure at the venturi outlet.
D— increase.

7704. (Refer to figure 4.) Which curve most nearly represents an aircraft engine's fuel/air ratio throughout its operating range?

A— 1.
B— 3.
C— 4.
D— 2.

7705. What will occur if the vapor vent float in a pressure carburetor loses its buoyancy?

A— A lean mixture will occur at all engine speeds.
B— The amount of fuel returning to the fuel tank from the carburetor will be increased.
C— The engine will continue to run after the mixture control is placed in IDLE CUTOFF.
D— A rich mixture will occur at all engine speeds.

7706. What method is ordinarily used to make idle speed adjustments on a float-type carburetor?

A— An adjustable throttle stop or linkage.
B— An orifice and adjustable tapered needle.
C— An adjustable needle in the drilled passageway which connects the airspace of the float chamber and the carburetor venturi.
D— A variable restrictor in the idle system fuel supply.

7707. For what primary purpose is a turbine engine fuel control unit trimmed?

A— To obtain new exhaust gas temperature limits.
B— To obtain maximum thrust output when desired.
C— To properly position the power levers.
D— To adjust the idle RPM.

7708. Which type of fuel control is used on most of today's turbine engines?

A— Electromechanical.
B— Mechanical.
C— Hydromechanical or electronic.
D— Hydraulic.

7709. Under which of the following conditions will the trimming of a turbine engine be most accurate?

A— Low moisture and a tail wind.
B— High wind and high moisture.
C— High moisture and low wind.
D— No wind and low moisture.

7710. (1) The mixture used at rated power in air cooled reciprocating engines is richer than the mixture used through the normal cruising range.

(2) The mixture used at idle in air cooled reciprocating engines is richer than the mixture used at rated power.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— neither No. 1 nor No. 2 is true.
D— both No. 1 and No. 2 are true.

7711. Under which of the following conditions would an engine run lean even though there is a normal amount of fuel present?

A— Engine operated at idle RPM.
B— The use of too high an octane rating fuel.
C— Incomplete fuel vaporization.
D— The carburetor air heater valve in the HOT position.

7712. During idle mixture adjustments, which of the following is normally observed to determine when the correct mixture has been achieved?

A— Changes in fuel/air pressure ratio.
B— Fuel flowmeter.
C— Fuel pressure indicator.
D— Changes in RPM or manifold pressure.

7713. An indication that the optimum idle mixture has been obtained occurs when the mixture control is moved to IDLE CUTOFF and manifold pressure

A— decreases momentarily and RPM drops slightly before the engine ceases to fire.
B— increases momentarily and RPM drops slightly before the engine ceases to fire.
C— increases momentarily and RPM remains steady before the engine ceases to fire.
D— decreases and RPM increases momentarily before the engine ceases to fire.

7714. The use of less than normal throttle opening during starting will cause

A— a rich mixture.
B— a lean mixture.
C— backfire due to lean fuel/air ratio.
D— preignition.

7715. When checking the idle mixture on a carburetor, the engine should be idling normally, then pull the mixture control toward the IDLE CUTOFF position. A correct idling mixture will be indicated by

A— an immediate decrease in RPM.
B— no change in RPM.
C— a decrease of 20 to 30 RPM before increasing.
D— an increase of 10 to 50 RPM before decreasing.

7716. When a new carburetor is installed on an engine,

A— warm up the engine and adjust the float level.
B— do not adjust the idle mixture setting; this was accomplished on the flow bench.
C— and the engine is warmed up to normal temperatures, adjust the idle mixture, then the idle speed.
D— the cruise mixture has to be adjusted after the first 10 hours of operation.

7717. The purpose of the back-suction mixture control in a float-type carburetor is to adjust the mixture by

A— regulating the pressure drop at the venturi.
B— regulating the pressure on the fuel in the float chamber.
C— regulating the suction on the mixture from behind the throttle valve.
D— restricting part of the fuel at all RPM settings.

7718. Reciprocating engine power will be decreased at all altitudes if the

A— air density is increased.
B— humidity is increased.
C— manifold pressure is increased.
D— free-air temperature is decreased.

7719. If the idling jet becomes clogged in a float-type carburetor, the

A— engine operation will not be affected at any RPM.
B— engine will not idle.
C— accelerating pump will not operate.
D— idle mixture becomes richer.

7720. An aircraft engine equipped with a pressure-type carburetor is started with the

A— primer while the mixture control is positioned at IDLE CUTOFF.
B— mixture control positioned at the AUTO-RICH position.
C— mixture control in the FULL-RICH position.
D— primer while the mixture control is positioned at the FULL-LEAN position.

7721. One of the best ways to increase engine power and control detonation and preignition is to

A— enrich the fuel/air mixture.
B— use water injection.
C— lean the fuel/air mixture.
D— increase the carburetor throttle valve setting.

7722. An excessively lean fuel/air mixture may cause

A— an increase in cylinder head temperature.
B— high oil pressure.
C— backfiring through the exhaust.
D— an increase in engine power.

7723. The density of air is very important when mixing fuel and air to obtain a correct fuel-to-air ratio. Which of the following weighs the most?

A— 98 parts of dry air and 2 parts of water vapor.
B— 75 parts of dry air and 25 parts of water vapor.
C— 100 parts of dry air.
D— 50 parts of dry air and 50 parts of water vapor.

7724. An air/fuel mixture ratio of 11:1 is

A— 1 part fuel to 11 parts air.
B— too rich to burn.
C— 1 part air to 11 parts fuel.
D— a lean mixture.

7725. The economizer system in a float-type carburetor

A— adds fuel to idle induction during sudden throttle movements.
B— keeps the fuel/air ratio constant.
C— functions only at cruise and idle speeds.
D— increases the fuel/air ratio at high power settings.

7726. A carburetor is prevented from leaning out during quick acceleration by the

A— power enrichment system.
B— boost venturi system.
C— mixture control system.
D— accelerating system.

7727. In turbine engines that utilize a pressurization and dump valve, the dump portion of the valve

A— cuts off fuel flow to the engine fuel manifold and dumps the manifold fuel into the combustor to burn just before the engine shuts down.
B— drains the engine manifold lines to prevent fuel boiling and subsequent deposits in the lines as a result of residual engine heat (at engine shutdown).
C— dumps extra fuel into the engine to support combustion during full power operation.
D— dumps extra fuel into the engine in order to provide for quick engine acceleration during rapid throttle advancement.

7728. What effect does high atmospheric humidity have on the operation of a jet engine?

A— Decreases engine pressure ratio.
B— Decreases compressor and turbine RPM.
C— Decreases fuel flow and increases EGT.
D— Has little or no effect.

7729. What are the positions of the pressurization valve and the dump valve in a jet engine fuel system when the engine is shut down?

A— Pressurization valve open, dump valve closed.
B— Pressurization valve closed, dump valve open.
C— Pressurization valve open, dump valve open.
D— Pressurization valve closed, dump valve closed.

7730. Which of the following may cause a lean mixture and high cylinder temperature?

A— Ruptured balance diaphragm.
B— Defective automatic mixture control unit.
C— Leaking primer.
D— Defective accelerating system.

7731. Which of the following is NOT an input parameter for a turbine engine fuel control unit?

A— Engine or high pressure compressor rotor speed.
B— Compressor inlet pressure.
C— Compressor inlet temperature.
D— Ambient humidity.

7732. (1) A supervisory electronic engine control (EEC) is a system that receives information regarding various engine operating parameters and adjusts a standard hydromechanical fuel control unit to obtain the most effective engine operation.

(2) A full-authority EEC is a system that receives all the necessary data for engine operation and develops the commands to various actuators to control engine parameters.

Regarding the above statements,

A— both No. 1 and No. 2 are true.
B— neither No. 1 nor No. 2 is true.
C— only No. 1 is true.
D— only No. 2 is true.

7733. Detonation occurs when the air/fuel mixture

A— burns too fast.
B— ignites before the time of normal ignition.
C— is too rich.
D— ignites while the intake valve is still open.

7734. What corrective action should be taken when a carburetor is found to be leaking fuel from the discharge nozzle?

A— Replace the needle valve and seat.
B— Raise the float level.
C— Turn the fuel off each time the aircraft is parked.
D— Replace the gasket between the float bowl and the throttle body.

7735. During what period does the fuel pump bypass valve open and remain open?

A— When the wobble pump is operated in a parallel-type fuel system.
B— When the fuel pump pressure is greater than the demand of the engine.
C— When the boost pump pressure is greater than fuel pump pressure.
D— When the fuel pump output is greater than the demand of the carburetor.

7736. Which of the following statements concerning a centrifugal-type fuel boost pump located in a fuel supply tank is not true?

A— Air and fuel vapors do not pass through a centrifugal-type pump.
B— Fuel can be drawn through the impeller section of the pump when it is not in operation.
C— The discharge side of the pump supplies fuel to the engine-driven pump.
D— The centrifugal-type pump is classified as a positive displacement pump.

7737. Where is the engine fuel shutoff valve usually located?

A— Aft of the firewall.
B— Adjacent to the carburetor.
C— Adjacent to the fuel pump.
D— Downstream of the engine-driven fuel pump.

7738. Boost pumps in a fuel system

A— operate during takeoff only.
B— are primarily used for fuel transfer.
C— are only in secondary tanks.
D— provide a positive flow of fuel to the engine pump.

7739. (Refer to figure 5.) What is the purpose of the fuel transfer ejectors?

A— To supply fuel under pressure to the engine-driven pump.
B— To assist in the transfer of fuel from the main tank to the boost pump sump.
C— To transfer fuel from the boost pump sump to the wing tank.
D— To assist in the transfer of fuel during climb.

7740. What is the purpose of an engine-driven fuel pump bypass valve?

A— To divert the excess fuel back to the main tank.
B— To prevent a damaged or inoperative pump from blocking the fuel flow of another pump in series with it.
C— To prevent excessive fuel pressure at the fuel inlet of the carburetor.
D— To divert the excess fuel from the pressure side of the pump to the inlet side of the pump.

7741. Most large aircraft reciprocating engines are equipped with which of the following types of engine-driven fuel pumps?

A— Rotary-vane-type fuel pump.
B— Wobble-type fuel pump.
C— Centrifugal-type fuel pump.
D— Gear-type fuel pump.

7742. When an electric primer is used, fuel pressure is built up by the

A— internal pump in the primer solenoid.
B— carburetor accelerating pump.
C— suction at the main discharge nozzle.
D— booster pump.

7743. The fuel pump relief valve directs excess fuel to the

A— fuel tank return line.
B— inlet side of the fuel pump.
C— inlet side of the fuel strainer.
D— fuel pump drain line.

7744. Which type of pump is commonly used as a fuel pump on reciprocating engines?

A— Gear.
B— Wobble.
C— Impeller.
D— Vane.

7745. The purpose of the diaphragm in most vane-type fuel pumps is to

A— maintain fuel pressure below atmospheric pressure.
B— equalize fuel pressure at all speeds.
C— prevent fuel pressure from exceeding venturi pressure.
D— compensate fuel pressures to altitude changes.

7746. The primary condition that allows microorganisms to grow in fuel is

A— warm temperatures.
B— the absence of light.
C— the presence of water.
D— the presence of dirt or other particulate contaminants.

7747. It is desirable that fuel lines have a continuous slope upward or downward and NOT have sharp curves or sharp rises and/or falls in order to

A— prevent vapor lock.
B— drain completely on engine shutdown.
C— decrease fluid friction in the lines.
D— reduce vibration of the lines.

7748. The fuel systems of aircraft certificated in the standard classification must include which of the following?

A— An engine-driven fuel pump and at least one auxiliary pump per engine.
B— An acceptable method for indicating the rate of fuel consumption for each engine.
C— A positive means of shutting off the fuel to all engines.
D— A reserve supply of fuel, available to the engine only after selection by the flightcrew, sufficient to operate the engines at least 30 minutes at METO power.

7749. Where should the main fuel strainer be located in the aircraft fuel system?

A— Downstream from the wobble pump check valve.
B— Downstream from the carburetor strainer.
C— At the lowest point in the fuel system.
D— At a point in the system lower than the carburetor strainer, but higher than the finger strainer.

7750. Where physical separation of the fuel lines from electrical wiring or conduit is impracticable, locate the fuel line

A— below the wiring and clamp the line securely to the airframe structure.
B— adjacent to the wiring and clamp them together.
C— above the wiring and clamp the line securely to the airframe structure.
D— inboard of the wiring and clamp both securely to the airframe structure.

7751. What is a characteristic of a centrifugal-type fuel boost pump?

A— It operates at very slow speeds.
B— It separates air and vapor from the fuel.
C— It has positive displacement.
D— It requires a relief valve.

7752. The Federal Aviation Regulations require the fuel flow rate for gravity systems (main and reserve) to be

A— 100 percent of the takeoff fuel consumption of the engine.
B— 125 percent of the takeoff fuel consumption of the engine.
C— 125 percent of the maximum, except takeoff, fuel consumption of the engine.
D— 150 percent of the takeoff fuel consumption of the engine.

7753. Fuel boost pumps are operated

A— to provide a positive flow of fuel to the engine.
B— during takeoff only.
C— primarily for fuel transfer to another tank.
D— automatically from fuel to the pressure source switch.

7754. A pilot reports that the fuel pressure fluctuates and exceeds the upper limits whenever the throttle is advanced. The most likely cause of the trouble is

A— a ruptured fuel pump relief-valve diaphragm.
B— a sticky fuel pump relief valve.
C— loose bolts in the fuel pump body to the relief-valve housing.
D— an air leak at the fuel pump relief-valve body.

7755. A fuel strainer or filter must be located between the

A— boost pump and tank outlet.
B— carburetor fuel chamber and throttle body.
C— tank outlet and the fuel metering device.
D— engine-driven fuel pump and vapor vent line.

7756. Fuel pump relief valves designed to compensate for atmospheric pressure variations are known as

A— thermo-pressure relief valves.
B— compensated-flow valves.
C— pressurized-relief valves.
D— balanced-type relief valves.

7757. Fuel lines are kept away from sources of heat and sharp bends and steep rises are avoided to reduce the possibility of

A— liquid lock.
B— vapor lock.
C— air lock.
D— positive lock.

7758. Fuel crossfeed systems are used in aircraft to

A— defuel tanks.
B— purge the fuel tanks.
C— jettison fuel in case of an emergency.
D— maintain aircraft stability.

7759. If an engine equipped with a float-type carburetor backfires or misses when the throttle is advanced, a likely cause is that the

A— fuel pressure is too high.
B— float level is too high.
C— main air bleed is clogged.
D— accelerating pump is not operating properly.

7760. A fuel pressure relief valve is required on

A— engine-driven diaphragm-type fuel pumps.
B— engine-driven vane-type fuel pumps.
C— centrifugal fuel boost pumps.
D— main fuel strainers.

7761. A rotary-vane pump is best described as

A— a positive-displacement pump.
B— a variable-displacement pump.
C— a boost pump.
D— an auxiliary pump.

7762. Fuel pressure produced by the engine-driven fuel pump is adjusted by the

A— bypass valve adjusting screw.
B— relief valve adjusting screw.
C— main fuel strainer adjusting screw.
D— engine-driven fuel pump adjusting screw.

7763. Gasoline and kerosene are used as turbine engine fuels. How do they compare in heat energy?

A— Gasoline has more heat energy per gallon than kerosene.
B— Kerosene has more heat energy per gallon than gasoline.
C— Gasoline and kerosene have the same heat energy per unit of volume.
D— Gasoline and kerosene have the same heat energy per unit of weight.

7764. What are the principle advantages of the duplex fuel nozzle used in most turbine engines?

A— Restricts the amount of fuel flow to a level where more efficient and complete burning of the fuel is achieved.
B— Provides better atomization and uniform flow pattern.
C— Allows a wider range of fuels and filters to be used.
D— Requires less filtering and blending of the fuel because of the dual passages in the nozzle head.

7765. It is necessary to control acceleration and deceleration rates in turbine engines in order to

A— prevent blowout or die-out.
B— prevent overtemperature.
C— enable the engine to heat and cool at controlled rates.
D— prevent friction between turbine wheels and the case due to expansion and contraction.

7766. When trimming a turbine engine, the fuel control is adjusted to

A— produce as much power as the engine is capable of producing.
B— set idle RPM and maximum speed or EPR.
C— allow the engine to produce maximum RPM without regard to power output.
D— restrict power to 100 percent without regard to specified RPM.

7767. Which of the following turbine fuel filters has the greatest filtering action?

A— Micron.
B— Wire mesh.
C— Wafer screen.
D— Stacked charcoal.

7768. What is the purpose of the flow divider in a turbine engine duplex fuel nozzle?

A— Allows an alternate flow of fuel if the primary flow clogs or is restricted.
B— Directs excessive fuel back to the fuel manifold.
C— Creates the primary and secondary fuel supplies.
D— Provides a flow path for bleed air which aids in the atomization of fuel.

7769. What causes the fuel divider valve to open in a turbine engine duplex fuel nozzle?

A— Fuel pressure.
B— Thermostatically controlled heat from the combustion section.
C— Bleed air after the engine reaches idle RPM.
D— An electrically operated solenoid.

7770. How often should float carburetors be overhauled?

A— At engine overhaul.
B— Annually.
C— After each 100 hours of operation.
D— At engine change.

7771. What is the final authority for the details of carburetor overhaul?

A— The local FAA safety inspector.
B— The Type Certificate Data Sheets for the engine.
C— The manufacturer's recommendations.
D— The AMFI text on aircraft carburetors.

7772. Why should a pressure carburetor be "soaked" before its installation is considered complete?

A— The gasoline prevents the fuel diaphragm from cracking.
B— It conditions the diaphragms to the exact pliability with which they were calibrated.
C— Soaking removes all of the preservative oil from the air chambers.
D— It loosens any contamination that may have entered the carburetor during storage.

7773. Which statement is true regarding proper throttle rigging of an airplane?

A— The throttle stop on the carburetor must be contacted before the stop in the cockpit.
B— The stop in the cockpit must be contacted before the stop on the carburetor.
C— The stop in the cockpit and the stop on the carburetor must be contacted at the same time.
D— The throttle control is properly adjusted when neither stop makes contact.

7774. What precaution should be taken when putting thread lubricant on a tapered pipe plug in a carburetor float bowl?

A— Put the thread lubricant on the first threads inside the float bowl casting.
B— Put the thread lubricant only on the first thread.
C— Do not use thread lubricant on any carburetor fitting.
D— Engage the first thread of the plug, then put a small amount of lubricant on the second thread and screw the plug in.

7775. Maximum power is normally considered to be developed in a reciprocating engine with an air/fuel mixture ratio of

A— 8:1.
B— 10:1.
C— 12:1.
D— 15:1.

7776. A method commonly used to prevent carburetor icing is to

A— preheat the intake air.
B— mix alcohol with the fuel.
C— coat the butterfly valve with glycerine.
D— electrically heat the venturi and throttle valve.

7777. Carburetor icing is most severe at

A— air temperatures between 30 and 40 °F.
B— high altitudes.
C— low engine temperatures.
D— air temperatures below 0 °F.

7778. Into what part of a reciprocating engine induction system is deicing alcohol normally injected?

A— The supercharger or impeller section.
B— The airstream ahead of the carburetor.
C— The low-pressure area ahead of the throttle valve.
D— The fuel ahead of the discharge nozzle.

7779. Carburetor icing on an engine equipped with a constant-speed propeller can be detected by

A— a decrease in power output with no change in manifold pressure or RPM.
B— an increase in manifold pressure with a constant RPM.
C— a decrease in manifold pressure with a constant RPM.
D— a decrease in manifold pressure with a decrease in RPM.

7780. What part of an aircraft in flight will begin to accumulate ice before any other?

A— Wing leading edge.
B— Propeller spinner or dome.
C— Nose or fuselage on multiengine aircraft.
D— Carburetor.

7781. Carburetor icing may be eliminated by which of the following methods?

A— Alcohol spray and electrically heated induction duct.
B— Ethylene glycol spray and heated induction air.
C— Alcohol spray and heated induction air.
D— Electrically heated air intake and ethylene glycol spray.

7782. Where would a carburetor air heater be located in a fuel injection system?

A— Between the air intake and the cylinders.
B— At the air intake entrance.
C— None is required.
D— Between the air intake and the venturi.

7783. An increase in manifold pressure when carburetor heat is applied indicates

A— excessive heat is being used.
B— ice was forming in the carburetor.
C— mixture was too lean.
D— overheating of cylinder heads.

7784. During full power output of an unsupercharged engine equipped with a float-type carburetor, in which of the following areas will the highest pressure exist?

A— Engine side of throttle valve.
B— Venturi.
C— Intake manifold.
D— Carburetor air scoop.

7785. The use of the carburetor air heater when it is not needed causes

A— a very lean mixture.
B— excessive increase in manifold pressure.
C— a decrease in power and possibly detonation.
D— damage to the carburetor from excessive heat.

7786. Which of the following will indicate normal operation of a single-stage, two-speed supercharger, when shifted from low to high impeller ratio during a ground check?

A— An increase in RPM, a momentary drop in oil pressure, and an increase in manifold pressure.
B— Oil and manifold pressure remain unchanged with an increase in RPM.
C— A drop in oil and manifold pressure with a decrease in RPM.
D— A drop in manifold pressure, a drop in oil pressure, RPM unchanged with an increase in fuel pressure.

7787. Which of the following is a function of the diffuser of an internal supercharger?

A— It assures uniform distribution of fuel/air mixture to the cylinders.
B— It decreases pressure of fuel/air mixture.
C— It increases the velocity of inlet air.
D— It introduces more air into the mixture.

7788. As manifold pressure increases in a reciprocating engine, the

A— volume of air in the cylinder increases.
B— weight of the fuel/air charge decreases.
C— density of air in the cylinder increases.
D— volume of air in the cylinders decreases.

7789. Which of the following statements regarding volumetric efficiency of an engine is true?

A— The volumetric efficiency of an engine will remain the same regardless of the amount of throttle opening.
B— It is impossible to exceed 100 percent volumetric efficiency of any engine regardless of the type of supercharger used.
C— Manifold pressure will increase as altitude horsepower is increased.
D— It is possible to exceed 100 percent volumetric efficiency of some engines by the use of superchargers of the proper type.

7790. If an engine is equipped with an external turbocharger and is started with the waste gate closed, the result might be

A— some damage to cores of the turbocharger intercooler.
B— overspeeding of the turbocharger with resultant damage to pistons and rings.
C— serious damage because of overboost.
D— nothing; the engine should be started with the waste gate closed.

7791. The primary purpose of the diffuser vanes located in the supercharger section of a radial engine is to

A— increase the pressure of the fuel/air charge.
B— increase the velocity of the fuel/air charge.
C— decrease the pressure of the fuel/air charge.
D— increase the temperature of the fuel/air charge.

7792. Which of the following would be a factor in the failure of an engine to develop full power at takeoff?

A— Failure to install the carburetor scoop air screen.
B— Improper adjustment of carburetor heat valve control linkage.
C— Excessively rich setting on the idle mixture adjustment.
D— Failure of the economizer valve to remain closed at takeoff throttle setting.

7793. If the turbosupercharger waste gate is completely closed,

A— none of the exhaust gases are directed through the turbine.
B— the manifold pressure will be lower than normal.
C— the turbosupercharger is in the OFF position.
D— all the exhaust gases are directed through the turbine.

7794. Boost manifold pressure is generally considered to be any manifold pressure above

A— 14.7" Hg.
B— 50" Hg.
C— 40" Hg.
D— 30" Hg.

7795. What is the purpose of the density controller in a turbocharger system?

A— Maintains constant air velocity at the carburetor venturi.
B— Limits the maximum manifold pressure that can be produced at other than full throttle conditions.
C— Limits the maximum manifold pressure that can be produced by the turbocharger at full throttle.
D— Maintains constant air velocity at the carburetor inlet.

7796. What is the purpose of the rate-of-change controller in a turbocharger system?

A— Limits the maximum manifold pressure that can be produced by the turbocharger at full throttle conditions.
B— Limits the maximum manifold pressure that can be produced at other than full throttle conditions.
C— Controls the rate at which the turbocharger discharge pressure will increase.
D— Controls the position of the waste gate after the aircraft has reached its critical altitude.

7797. What directly regulates the speed of a turbosupercharger?

A— Turbine.
B— Compressor.
C— Waste gate.
D— Throttle.

7798. What is the purpose of a turbocharger system for a small reciprocating aircraft engine?

A— Compresses the air to hold the cabin pressure constant after the aircraft has reached its critical altitude.
B— Maintains constant air velocity in the intake manifold.
C— Compresses air to maintain manifold pressure constant from sea level to the critical altitude of the engine.
D— Maintains variable air pressure to the carburetor venturi.

7799. What are the three basic regulating components of a sea-level boosted turbocharger system?

1. Exhaust bypass assembly.
2. Compressor assembly.
3. Pump and bearing casing.
4. Density controller.
5. Differential pressure controller.

A— 2, 3, 4.
B— 1, 4, 5.
C— 3, 4, 5.
D— 1, 2, 3.

7800. The differential pressure controller in a turbocharger system

A— reduces bootstrapping during part-throttle operation.
B— positions the waste gate valve for maximum power.
C— provides a constant fuel to air ratio.
D— positions the waste gate valve to minimize exhaust back pressure.

7801. The purpose of a sonic venturi on a turbocharged engine is to

A— limit the amount of air that can flow from the turbocharger into the cabin for pressurization.
B— increase the weight of the fuel/air charge.
C— increase the amount of air that can flow from the turbocharger into the cabin for pressurization.
D— increase the velocity of the fuel/air charge.

7802. What is used to drive an externally driven supercharger?

A— Engine oil pressure.
B— Gear driven directly from the engine crankshaft.
C— Exhaust gases driving a turbine.
D— Belt driven through a pulley arrangement.

7803. What are the three parts of a typical turbosupercharger for a large reciprocating engine?

1. Density controller.
2. Compressor assembly.
3. Differential pressure controller.
4. Exhaust gas turbine assembly.
5. Pump and bearing casing.

A— 1, 2, 3.
B— 2, 4, 5.
C— 1, 3, 5.
D— 3, 4, 5.

7804. If carburetor or induction system icing is not present when carburetor heat is applied with no change in the throttle setting, the

A— mixture will become richer.
B— manifold pressure will increase.
C— engine power output will increase.
D— engine RPM will increase.

7805. When starting an engine equipped with a carburetor air heater, in what position should the heater be placed?

A— Hot.
B— Cold.
C— Halfway open.
D— Neutral.

7806. The application of carburetor heat during engine operation will

A— decrease the weight of the fuel/air charge.
B— decrease the volume of air in the cylinder.
C— increase the volume of air in the cylinder.
D— increase the density of air in the cylinder.

7807. The application of carburetor heat will have which of the following effects?

A— The manifold pressure will be increased.
B— The mixture will become leaner.
C— Less throttle opening will be required for the same power.
D— The mixture will become richer.

7808. When operating an engine, the application of carburetor heat will have what effect on the fuel/air mixture?

A— Enriching the mixture because the AMC cannot make a correction for increased temperature.
B— Leaning the mixture because the AMC cannot make a correction for increased temperature.
C— Enriching the mixture until the AMC can make a compensation.
D— Leaning the mixture until the AMC can make a compensation.

7809. In addition to causing accelerated wear, dust or sand ingested by a reciprocating engine may also cause

A— lead silicate fouling of spark plugs.
B— sludge formation.
C— varnish formation.
D— acid formation.

7810. In an airplane equipped with an alternate air system, if the main air duct air filter becomes blocked or clogged, the

A— system will automatically allow warm, unfiltered air to be drawn into the carburetor.
B— flow of air to the carburetor will be slowed or cut off unless alternate air is selected.
C— flow of air to the carburetor will be slowed or cut off regardless of the alternate air valve position.
D— system will automatically allow warm, filtered alternate air to be drawn into the carburetor.

7811. If a fire starts in the induction system during the engine starting procedure, what should the operator do?

A— Turn off the fuel switches to stop the fuel.
B— Continue cranking the engine.
C— Backfire the engines to blow the fire out.
D— Turn off all switches.

7812. On small aircraft engines, fuel vaporization may be increased by

A— cooling the air before it enters the engine.
B— circulating the fuel and air mixture through passages in the oil sump.
C— heating the fuel before it enters the carburetor.
D— routing the exhaust gas around the fuel lines.

7813. The action of a carburetor airscoop is to supply air to the carburetor, but it may also

A— prevent ice formation.
B— cool the engine.
C— keep fuel lines cool and prevent vapor lock.
D— increase the pressure of the incoming air by ram effect.

7814. A carburetor pre-heater is not generally used on takeoff unless absolutely necessary because of the

A— loss of power and possible detonation.
B— drain on the aircraft electrical system.
C— fire hazard involved.
D— inability of the engine to supply enough heat to make any difference.

7815. The primary purpose of baffles and deflectors installed around cylinders of air-cooled aircraft engines is to

A— create a low pressure area aft of the cylinders.
B— prevent impact and erosion damage to the cylinder head and barrel cooling fins.
C— force cooling air into close contact with all parts of the cylinders.
D— increase the volume of air used to cool the engine.

7816. What is the purpose of an augmenter used in some reciprocating engine exhaust systems?

A— To reduce exhaust back pressure.
B— To aid in cooling the engine.
C— To assist in displacing the exhaust gases.
D— To augment the surface area of the exhaust extension.

7817. Aircraft reciprocating engine cylinder baffles and deflectors should be repaired as required to prevent loss of

A— power.
B— fin area.
C— carburetor air.
D— cooling.

7818. If cracks in cooling fins do not extend into the cylinder head, they may be repaired by

A— stop drilling extremities of cracks in the head portion.
B— removing affected area and contour filing within limits.
C— welding or brazing, preferably brazing.
D— complete coverage by appropriate metalizing within limits.

7819. Which of the following should a mechanic consult to determine the maximum amount of cylinder cooling fin that could be removed when re-profiling?

A— AC 43.13-1A.
B— Engine manufacturer's service or overhaul manual.
C— FAR Part 43, appendix A.
D— AC 43.13-2A.

7820. A bent cooling fin on an aluminum cylinder head

A— will cause rejection of the cylinder.
B— should be sawed off and filed smooth.
C— should be left alone if no crack has formed.
D— should be stop drilled or a small radius filed at the point of the bend.

7821. Where are cooling fins usually located on air-cooled engines?

A— Exhaust side of cylinder head, connecting rods, and cylinder walls.
B— Exhaust side of the cylinder head, inside the pistons, and connecting rods.
C— Cylinder head, cylinder walls, and inside the piston skirt.
D— Cylinder head, cylinder barrel, and inside the piston head.

7822. How do cowl flaps aid in cooling a horizontally opposed aircraft engine?

A— Furnishes ram air to the engine cylinders.
B— Directs air through the engine cylinders.
C— Streamlines the engine.
D— Controls the amount of air passing around the engine.

7823. What is the position of the cowl flaps during flight operation under normal conditions?

A— Closed.
B— Open.
C— An intermediate position.
D— Closed during takeoff, open during cruise.

7824. Generally, a small crack just started in a cylinder baffle

A— requires removal and replacement of the baffle.
B— requires no action unless it grows or is branched into two cracks.
C— must be patched with thicker than original material.
D— may be stop drilled.

7825. Which of the following assists in removing heat from the metal walls and fins of an air-cooled cylinder assembly?

A— Integral heat pump.
B— Intercooler system.
C— Baffle and cowl arrangement.
D— Heat muff exchanger.

7826. During ground operation of an engine, the cowl flaps should be in what position?

A— Fully closed.
B— Fully open.
C— One-third open.
D— Two-thirds open.

7827. The component(s) in turbine engines that operate(s) at the highest temperatures is/are the

A— first stage turbine nozzle guide vanes.
B— combustor liners.
C— turbine disks.
D— exhaust cone.

7828. During an operational check of an electrically powered radial engine cowl flap system, the motor fails to operate. Which of the following is the first to be checked?

A— Flap actuator motor circuit breaker.
B— Cockpit control switch.
C— Flap actuator jackscrew synchronization switch.
D— Flap actuator motor.

7829. (1) Some aircraft exhaust systems include an augmenter system to draw additional cooling air over the engine.

(2) Augmenter systems may provide heated air for cabin heat, anti-icing and defrosting systems.

Regarding the above statements,

A— neither No. 1 nor No. 2 is true.
B— only No. 1 is true.
C— both No. 1 and No. 2 are true.
D— only No. 2 is true.

7830. Which of the following defects would likely cause a hot spot on a reciprocating engine cylinder?

A— Too much cooling fin area broken off.
B— A cracked cylinder baffle.
C— A cracked cylinder baffle blast tube.
D— Cowling air seal leakage.

7831. What part of an air-cooled cylinder assembly has the greatest fin area per square inch?

A— Cylinder barrel.
B— Rear of the cylinder head.
C— Junction of the cylinder barrel and head.
D— Exhaust valve port.

7832. Reciprocating engines used in helicopters are cooled by

A— cowl flaps.
B— the downdraft from the main rotor.
C— a fan mounted on the engine.
D— blast tubes on either side of the engine mount.

7833. The greatest portion of heat generated by combustion in a typical aircraft reciprocating engine is

A— converted into useful power.
B— removed by the oil system.
C— carried out with the exhaust gases.
D— dissipated through the cylinder walls and heads.

7834. A broken cooling fin on a cylinder head

A— is cause for rejection of the head.
B— may be filed to smooth contours if damage and/or repair limits are not exceeded.
C— may only be repaired by welding.
D— should be left alone.

7835. An engine becomes overheated due to excessive taxiing or improper ground runup. Prior to shutdown, operation must continue until cylinders have cooled, by running engine at

A— low RPM with oil dilution system activated.
B— idle RPM.
C— high RPM with mixture control in lean position.
D— high RPM with mixture control in rich position.

7836. Cylinder head temperatures are measured by means of an indicator and a

A— resistance bulb sensing device.
B— wheatstone bridge sensing device.
C— thermocouple sensing device.
D— Bourdon tube sensing device.

7837. The rows of cylinders on a twin-row radial engine are staggered with respect to each other

A— to facilitate cooling.
B— to permit the use of one main dynamic damper.
C— so that one cam gear can operate both rows.
D— so one magneto can fire the front plugs on both rows.

7838. High cylinder head temperatures are likely to result from

A— a very lean mixture at high power settings.
B— an increased oil consumption.
C— fouled spark plugs.
D— a very rich mixture at high power settings.

7839. The purpose of an intercooler when used with a turbocharger is to

A— cool the exhaust gases before they come in contact with the turbo drive.
B— cool the turbocharger bearings.
C— cool the mixture of fuel and air entering the internal turbocharger.
D— cool the air entering the carburetor from the turbocharger.

7840. Prolonged idling of an engine will usually result in

A— excessive cylinder head temperatures.
B— burned magneto points.
C— excessive oil consumption.
D— foreign material buildup on spark plugs.

7841. Which of the following best describes a cylinder muff?

A— A device to absorb sound and reduce engine operation noise.
B— A heating shroud used to provide cabin heat.
C— A separate sleeve of aluminum cooling fins shrunk on to the steel inner cylinder sleeve.
D— A cooling jacket for liquid-cooled engines.

7842. What is the function of a blast tube as found on aircraft engines?

A— A means of cooling the engine by utilizing the propeller backwash.
B— A device to indicate airspeed.
C— A tube used to load a cartridge starter.
D— A device to cool an engine accessory.

7843. The air passing through the combustion chamber of a jet engine is

A— used to support combustion and to cool the engine.
B— speeded up and heated by the action of the turbines.
C— entirely combined with the fuel and burned.
D— heated by the fuel and expanded, but otherwise unchanged.

7844. Which of the following results in a decrease in volumetric efficiency?

A— Cylinder head temperature too low.
B— Carburetor air temperature too low.
C— Part-throttle operation.
D— Short intake pipes of large diameter.

7845. The undersides of pistons are frequently finned. The principal reason is to

A— provide sludge chambers and sediment traps.
B— provide for greater heat transfer to the engine oil.
C— support ring grooves and piston pins.
D— support the piston pin bosses.

7846. What is the position of the cowl flaps during engine starting and warmup operations under normal conditions?

A— Full open at all times.
B— Full closed at all times.
C— Open for starting, closed for warmup.
D— An intermediate position.

7847. Increased engine heat will cause volumetric efficiency to

A— remain the same.
B— decrease or increase depending on the engine RPM.
C— decrease.
D— increase.

7848. Why is high nickel chromium steel used in many exhaust systems?

A— Low expansion coefficient and high flexibility.
B— High heat conductivity and flexibility.
C— Corrosion resistance and low expansion coefficient.
D— Corrosion resistance and high heat conductivity.

7849. Slip joints are required in most exhaust collector systems because of the

A— difficulty in aligning mounting bolts.
B— necessity of installing the unit piece by piece.
C— expansion and contraction caused by high heat and cooling.
D— installation requirements.

7850. One source commonly used for carburetor air heat is

A— electric heating elements.
B— cabin heater.
C— gasoline or alcohol flame.
D— exhaust gases.

7851. The hot section of a turbine engine is particularly susceptible to which of the following kind of damage?

A— Galling.
B— Pitting.
C— Cracking.
D— Scoring.

7852. What is the purpose of a slip joint in an exhaust collector ring?

A— It aids in alignment and absorbs expansion.
B— It reduces vibration and increases cooling.
C— It permits the collector ring to be installed in one piece.
D— It increases service life of collector ring segments.

7853. Sodium-filled valves are advantageous to an aviation engine because they

A— cost less and run hotter.
B— are lighter.
C— have great strength properties.
D— dissipate heat well.

7854. What type nuts are used to hold an exhaust system to the cylinders?

A— Brass or special locknuts.
B— High-temperature fiber self-locking nuts.
C— Low-temperature steel self-locking nuts.
D— High-temperature aluminum self-locking nuts.

7855. Repair of exhaust system components

A— is impossible because the material cannot be identified.
B— must be accomplished by the component manufacturer.
C— is usually accomplished using fiberglass patch kits.
D— is not recommended to be accomplished in the field.

7856. On turbine-powered airplanes, how much reverse thrust is usually required for minimum braking requirements?

A— At least 50 percent of the full forward thrust of the engine.
B— At least 100 percent of the full forward thrust of the engine.
C— At least 75 percent of the full forward thrust of the engine.
D— At least 25 percent of the full forward thrust of the engine.

7857. On an aircraft that utilizes an exhaust heat exchanger as a source of cabin heat, how should the exhaust system be inspected?

A— X-rayed to detect any cracks.
B— Tested by use of an exhaust gas analyzer.
C— Hydrostatically tested.
D— With the heater air shroud removed.

7858. How should ceramic-coated exhaust components be cleaned?

A— By sandblasting.
B— With alkali.
C— By degreasing.
D— By mechanical means.

7859. Which of the following indicates that a combustion chamber of a jet engine is not operating properly?

A— Clam shells stick in thrust reverse position.
B— Hot spots on the tail cone.
C— Missing teeth in the synchronizing gear segment.
D— Warping of the clam shells.

7860. Select a characteristic of a good weld on exhaust stacks.

A— The weld should be built up 1/8 inch.
B— Heavy oxide is formed on the base metal close to the weld.
C— Porousness or projecting globules should show in the weld.
D— The weld should taper off smoothly into the base metal.

7861. How do the turbines which are driven by the exhaust gases of a turbo-compound engine contribute to total engine power output?

A— By driving the crankshaft through suitable couplings.
B— By causing the exhaust back pressure to remain below atmospheric pressure at all operating altitudes.
C— By driving the supercharger, thus relieving the engine of the supercharging load.
D— By converting the latent heat energy of the exhaust gases into thrust by collecting and accelerating them.

7862. How should corrosion-resistant steel parts such as exhaust collectors be blast cleaned?

A— Use steel grit which has not previously been used on soft iron.
B— Use super fine granite grit.
C— Use sand which has not previously been used on iron or steel.
D— Use soft iron chill which has not previously been used on hardened steel.

7863. Power recovery turbines used on some reciprocating engines are driven by the

A— exhaust gas pressure.
B— crankshaft.
C— velocity of the exhaust gases.
D— fluid drive coupling.

7864. Reciprocating engine exhaust systems that have repairs or sloppy weld beads which protrude internally are unacceptable because they cause

A— base metal fatigue.
B— localized cracks.
C— unrestricted exhaust gas flow.
D— local hot spots.

7865. Ball joints in reciprocating engine exhaust systems should be

A— tight enough to prevent any movement.
B— disassembled and the seals replaced every engine change.
C— secured to each exhaust extension with AN bolts, plain nuts, and lockwashers.
D— loose enough to permit some movement.

7866. All of the following are recommended markers for reciprocating engine exhaust systems except

A— India ink.
B— chalk.
C— lead pencil.
D— Prussian blue.

7867. What is the function of the thrust reverser of a turbine engine?

A— To extend the reverser flaps.
B— To reverse the flow of exhaust gases.
C— To reverse the airflow through engine inlet.
D— To reduce the velocity of exhaust gases.

7868. How are combustion liner walls cooled in a gas turbine engine?

A— By secondary air flowing through the combustion chamber.
B— By the pattern of holes and louvers cut in the diffuser section.
C— By ram air from engine air intake.
D— By bleed air vented from the engine air inlet.

7869. Augmenter tubes are part of which reciprocating engine system?

A— Induction.
B— Oil.
C— Exhaust.
D— Fuel.

7870. Dislodged internal muffler baffles on a small reciprocating engine may

A— obstruct the muffler outlet and cause excessive exhaust back pressure.
B— cause the engine to run excessively cool.
C— cause high fuel and oil consumption.
D— result in an engine fire.

7871. What is the purpose of an exhaust outlet guard on a small reciprocating engine?

A— To prevent dislodged muffler baffles from obstructing the muffler outlet.
B— To reduce spark exit.
C— To protect the muffler outlet during ground servicing activities.
D— To shield adjacent components from excessive heat.

7872. What could be a result of undetected exhaust system leaks in a reciprocating engine powered airplane?

A— Pilot incapacitation resulting from carbon monoxide entering the cabin.
B— A rough-running engine.
C— Desired power settings will not be attained.
D— Excessive engine operating temperatures.

7873. How may reciprocating engine exhaust system leaks be detected?

A— An exhaust trail aft of the tailpipe on the airplane exterior.
B— Low cylinder head temperature indication.
C— Fluctuating manifold pressure indication.
D— Signs of exhaust soot inside cowling and on adjacent components.

7874. Turbocharged engine exhaust systems often operate at temperatures (TIT = turbine inlet temperature)

A— between 300 and 500 °F TIT.
B— between 500 and 700 °F TIT.
C— in excess of 1500 °F TIT.
D— near 1,800 °F TIT.

7875. Most exhaust system failures result from thermal fatigue cracking in the areas of stress concentration. This condition is usually caused by

A— the drastic temperature change which is encountered at altitude.
B— improper welding techniques during manufacture.
C— the low temperatures which the exhaust system is subjected to during initial warmup.
D— the high temperatures at which the exhaust system operates.

7876. How is aircraft electrical power for propeller deicer systems transferred from the engine to the propeller hub assembly?

A— By slip rings and segment plates.
B— By slip rings and brushes.
C— By collector ring and transducer.
D— By flexible electrical connectors.

7877. How is anti-icing fluid ejected from the slinger ring on a propeller?

A— By ejector valves.
B— By pump pressure.
C— By centripetal force.
D— By centrifugal force.

7878. On most reciprocating multiengine aircraft, automatic propeller synchronization is accomplished through the actuation of the

A— blade switches.
B— throttle levers.
C— propeller governors.
D— propeller control levers.

7879. Propeller fluid anti-icing systems generally use which of the following?

A— Ethylene glycol.
B— Isopropyl alcohol.
C— Denatured alcohol.
D— Ethyl alcohol.

7880. What is a function of the automatic propeller synchronizing system on multiengine aircraft?

A— To increase vibration and reduce noise.
B— To control the tip speed of all propellers.
C— To control engine RPM and reduce vibration.
D— To control the power output of all engines.

7881. Ice formation on propellers, when the aircraft is in flight, will

A— decrease thrust and cause excessive vibration.
B— increase aircraft stall speed and increase noise.
C— decrease aircraft stall speed and increase noise.
D— increase thrust and cause excessive vibration.

7882. What unit in the propeller anti-icing system controls the output of the pump?

A— Pressure relief valve.
B— Rheostat.
C— Cycling timer.
D— Current limiter.

7883. Proper operation of electric deicing boots on individual propeller blades may best be determined by

A— feeling the boots to see if they are heating.
B— observing the ammeter or loadmeter for current flow.
C— timing the inflation and deflation sequence.
D— checking the ammeter for flickering and feeling the boots for sequence of heating.

7884. A propeller synchrophasing system allows a pilot to reduce noise and vibration by

A— adjusting the phase angle between the propellers on an aircraft's engines.
B— differing the RPM of all propellers.
C— adjusting the plane of rotation of all propellers.
D— setting the pitch angle of all propellers exactly the same.

7885. Which of the following determines oil and grease specifications for lubrication of propellers?

A— FAA engineering.
B— American Petroleum Institute.
C— Engine manufacturer.
D— Propeller manufacturer.

7886. Grease used in aircraft propellers reduces the frictional resistance of moving parts and is easily molded into any form under pressure. This statement defines

A— antifriction and plasticity characteristics of grease.
B— antifriction and chemical stability of grease.
C— antiwear properties and maximum cooling ability of grease.
D— viscosity and melting point of grease.

7887. What type of imbalance will cause a two-blade propeller to have a persistent tendency to come to rest in a horizontal position (with the blades parallel to the ground) while being checked on a propeller balancing beam?

A— Vertical.
B— Horizontal.
C— Dynamic.
D— Harmonic.

7888. What is the purpose of an arbor used in balancing a propeller?

A— To support the propeller on the balance knives.
B— To level the balance stand.
C— To indicate the weight to be added or removed.
D— To mark the propeller blades where weights are to be attached.

7889. If a blade of a particular metal propeller is shortened because of damage to the tip, the remaining blade(s) must be

A— ground down at the shank to balance the weight.
B— reset (blade angle) to compensate for the shortened blade.
C— returned to the manufacturer for alteration.
D— reduced to conform with the shortened blade.

7890. The application of more protective coating on one blade than the other when refinishing a wood propeller

A— has little or no effect.
B— may be used to stabilize water content in the wood.
C— should never be done.
D— may be necessary to achieve final balancing.

7891. Apparent engine roughness is often a result of propeller unbalance. The effect of an unbalanced propeller will usually be

A— approximately the same at all speeds.
B— unnoticeable, except within the propeller's critical range.
C— greater at low RPM.
D— greater at high RPM.

7892. Which of the following is used to correct horizontal unbalance of a wood propeller?

A— Putty.
B— Brass screws.
C— Shellac.
D— Solder.

7893. Propeller aerodynamic (thrust) unbalance can be largely eliminated by

A— correct blade contouring and angle setting.
B— static balancing.
C— dynamic balancing.
D— keeping the propeller blades within the same plane of rotation.

7894. A powerplant using a hydraulically controlled constant-speed propeller is operating within the propeller's constant-speed range at a fixed throttle setting. If the tension of the propeller governor control spring (speeder spring) is reduced by movement of the cockpit propeller control, the propeller blade angle will

A— increase, engine manifold pressure will increase, and engine RPM will decrease.
B— decrease, engine manifold pressure will increase, and engine RPM will decrease.
C— decrease, engine manifold pressure will decrease, and engine RPM will increase.
D— increase, engine manifold pressure will decrease, and engine RPM will increase.

7895. Why is the pulley stop screw on a propeller governor adjustable?

A— To limit the maximum engine speed during takeoff.
B— To maintain the proper blade angle for cruising.
C— To limit the maximum propeller pitch for takeoff.
D— To maintain the most efficient engine speed for climbing.

7896. During engine operation at speeds lower than those for which the constant-speed propeller control can govern in the INCREASE RPM position, the propeller will

A— remain in the full LOW RPM position.
B— remain in full HIGH PITCH position.
C— maintain engine RPM in the normal manner until the HIGH PITCH stop is reached.
D— remain in the full LOW PITCH position.

7897. When engine power is increased, the constant-speed propeller tries to function so that it will

A— maintain the RPM, decrease the blade angle, and maintain a low angle of attack.
B— increase the RPM, decrease the blade angle, and maintain a low angle of attack.
C— maintain the RPM, increase the blade angle, and maintain a low angle of attack.
D— increase the RPM, increase the blade angle, and maintain a high angle of attack.

7898. The propeller governor controls the

A— oil to and from the pitch changing mechanism.
B— relief valve in the accumulator assemblies.
C— spring tension on the boost pump speeder spring.
D— linkage and counterweights from moving in and out.

7899. During the on-speed condition of a propeller, the

A— centrifugal force acting on the governor flyweights is greater than the tension of the speeder spring.
B— tension on the speeder spring is greater than the centrifugal force acting on the governor flyweights.
C— tension on the speeder spring is less than the centrifugal force acting on the governor flyweights.
D— centrifugal force of the governor flyweights is equal to the speeder spring force.

7900. What actuates the pilot valve in the governor of a constant-speed propeller?

A— Engine oil pressure.
B— Governor flyweights.
C— Propeller control lever.
D— Governor pump oil pressure.

7901. What action takes place when the cockpit control lever for a hydromatic, constant-speed propeller is actuated?

A— Compression of the speeder spring is changed.
B— The transfer valve changes position.
C— The governor booster pump pressure is varied.
D— The governor bypass valve is positioned to direct oil pressure to the propeller dome.

7902. What will happen to the propeller blade angle and the engine RPM if the tension on the propeller governor control spring (speeder spring) is increased?

A— Blade angle will increase and RPM will increase.
B— Blade angle will decrease and RPM will decrease.
C— Blade angle will increase and RPM will decrease.
D— Blade angle will decrease and RPM will increase.

7903. How is the speed of a hydromatic constant-speed propeller changed in flight?

A— By varying the output of the governor booster pump.
B— By advancing the throttle to a higher manifold pressure.
C— By changing the rotational speed of the pilot valve in the governor.
D— By changing the load tension against the flyweights in the governor.

7904. When the centrifugal force acting on the propeller governor counterweights overcomes the tension on the speeder spring, a propeller is in what speed condition?

A— On-speed.
B— Underspeed.
C— In between condition.
D— Overspeed.

7905. What operational force causes the greatest stress on a propeller?

A— Aerodynamic twisting force.
B— Centrifugal force.
C— Thrust bending force.
D— Torque bending force.

7906. What operational force tends to increase propeller blade angle?

A— Centrifugal twisting force.
B— Aerodynamic twisting force.
C— Thrust bending force.
D— Torque bending force.

7907. How is a propeller controlled in a large aircraft with a turboprop installation?

A— Independently of the engine.
B— By varying the engine RPM except for feathering and reversing.
C— By varying the gear ratio between the propeller and the engine.
D— By the engine power lever.

7908. How does the aerodynamic twisting force affect operating propeller blades?

A— It tends to bend the blades opposite the direction of rotation.
B— It tends to turn the blades to a high blade angle.
C— It tends to bend the blades forward.
D— It tends to turn the blades to a low blade angle.

7909. Which of the following best describes the blade movement of a hydromatic propeller that is in the high RPM position when reversing action is begun?

A— Low pitch directly to reverse pitch.
B— No movement, because this type propeller cannot be placed in reverse pitch from the high RPM position.
C— Low pitch through high pitch to reverse pitch.
D— Low pitch through feather position to reverse pitch.

7910. Propellers exposed to salt spray should be cleaned with

A— a caustic solution.
B— steel wool.
C— fresh water.
D— soapy water.

7911. How can a steel propeller hub be tested for cracks?

A— By anodizing.
B— By magnetic particle inspection.
C— By electrotesting.
D— By etching.

7912. Repairs of aluminum alloy adjustable pitch propellers are not permitted to be made on which of the following propeller blade areas?

A— Shank.
B— Leading edge.
C— Tip.
D— Trailing edge.

7913. Which of the following functions requires the use of a propeller blade station?

A— Measuring blade angle.
B— Installation and removal of propeller.
C— Indexing blades.
D— Propeller balancing.

7914. The propeller blade angle is defined as the acute angle between the airfoil section chord line (at the blade reference station) and which of the following?

A— The plane of rotation.
B— The relative wind.
C— The propeller thrust line.
D— The axis of blade rotation during pitch change.

7915. During which of the following conditions of flight will the blade pitch angle of a constant-speed propeller be the greatest?

A— Approach to landing.
B— Climb following takeoff.
C— High-speed, high-altitude cruising flight.
D— Takeoff from sea level.

7916. If a hydromatic propeller is feathered and then immediately unfeathers itself, a probable cause of the trouble is that the

A— governor is not cutting out in high pitch.
B— dome pressure relief valve is stuck in the closed position.
C— distributor relief valve is stuck in the closed position.
D— pressure cutout switch is stuck in the closed position.

7917. The actual distance a propeller moves forward through the air during one revolution is known as the

A— effective pitch.
B— geometric pitch.
C— relative pitch.
D— resultant pitch.

7918. The pitch-changing mechanism of the hydromatic propeller is lubricated by

A— the pitch-changing oil.
B— using an approved-type grease in a grease gun at intervals prescribed by the propeller manufacturer.
C— applying an approved grease to the working surfaces.
D— thoroughly greasing, necessary only during propeller overhaul.

7919. What is the result of moving the throttle on a reciprocating engine when the propeller is in the constant-speed range with the engine developing cruise power?

A— Opening the throttle will cause an increase in blade angle.
B— Closing the throttle will cause an increase in blade angle.
C— The RPM will vary directly with any movement of the throttle.
D— Movement of the throttle will not affect the blade angle.

7920. Propeller blade stations are measured from the

A— index mark on the blade shank.
B— hub centerline.
C— blade base.
D— blade tip.

7921. The thrust produced by a rotating propeller is a result of

A— propeller slippage.
B— an area of low pressure behind the propeller blades.
C— an area of decreased pressure immediately in front of the propeller blades.
D— the angle of relative wind and rotational velocity of the propeller.

7922. Why is a constant-speed counterweight propeller normally placed in full HIGH PITCH position before the engine is stopped?

A— To prevent exposure and corrosion of the pitch changing mechanism.
B— To prevent hydraulic lock of the piston when the oil cools.
C— To prevent overheating of the engine during the next start.
D— To reduce engine temperatures more rapidly.

7923. The low pitch stop on a constant-speed propeller is usually set so that

A— the engine will turn at its rated takeoff RPM at sea level when the throttle is opened to allowable takeoff manifold pressure.
B— maximum allowable engine RPM cannot be exceeded with any combination of manifold pressure, altitude, or forward speed.
C— the limiting engine manifold pressure cannot be exceeded with any combination of throttle opening, altitude, or forward speed.
D— governing is permitted in cruising power descent from rated altitude.

7924. The angle-of-attack of a rotating propeller blade is measured between the blade chord or face and which of the following?

A— Plane of blade rotation.
B— Full low-pitch blade angle.
C— Relative airstream.
D— Geometric pitch angle required to produce the same thrust.

7925. The centrifugal twisting moment (CTM) of an operating propeller tends to

A— increase the pitch angle.
B— reduce the pitch angle.
C— bend the blades in the direction of rotation.
D— bend the blades rearward in the line of flight.

7926. Which of the following is identified as the cambered or curved side of a propeller blade, corresponding to the upper surface of a wing airfoil section?

A— Blade back.
B— Blade chord.
C— Blade leading edge.
D— Blade face.

7927. Which of the following best describes the blade movement of a full-feathering, constant-speed propeller that is in the LOW RPM position when the feathering action is begun?

A— High pitch through low pitch to feather position.
B— Low pitch directly to feather position.
C— High pitch directly to feather position.
D— Low pitch through high pitch to feather position.

7928. The holding coil on a hydromatic propeller feathering button switch holds a solenoid relay closed that applies power to the propeller

A— governor.
B— synchronizer.
C— dome feathering mechanism.
D— feathering pump motor.

7929. What is the primary purpose of the metal tipping which covers the blade tips and extends along the leading edge of each wood propeller blade?

A— To increase the lateral strength of the blade.
B— To prevent impact damage to the tip and leading edge of the blade.
C— To increase the longitudinal strength of the blade.
D— To provide a true airfoil the entire length of the blade.

7930. Blade angle is an angle formed by a line perpendicular to the crankshaft and a line formed by the

A— relative wind.
B— apparent wind.
C— chord of the blade.
D— blade face.

7931. Propeller blade station numbers increase from

A— hub to tip.
B— tip to hub.
C— leading edge to aft edge.
D— aft edge to leading edge.

7932. The aerodynamic force acting on a rotating propeller blade operating at a normal pitch angle tends to

A— reduce the pitch angle.
B— increase the pitch angle.
C— bend the blades rearward in the line of flight.
D— bend the blades in the direction of rotation.

7933. Hydromatic propeller pitch change gear preload may be adjusted by

A— moving the vernier preload lockplate clockwise to increase preload and counterclockwise to reduce preload.
B— adjusting the stop plate that limits the movement of the movable cam within the stationary cam.
C— varying the spider shim thickness used between the spider shim plate and the blade bushing face.
D— varying the thickness of the shims between the fixed cam base and the dome-barrel shelf.

7934. Which of the following forces or combination of forces operates to move the blades of a constant-speed counterweight-type propeller to the HIGH PITCH position?

A— Engine oil pressure acting on the propeller piston-cylinder arrangement.
B— Engine oil pressure acting on the propeller piston-cylinder arrangement and centrifugal force acting on the counterweights.
C— Centrifugal force acting on the counterweights.
D— Prop governor oil pressure acting on the propeller piston-cylinder arrangement.

7935. The distributor valve assembly of a hydromatic propeller changes position and reverses the oil passages to the propeller only when the propeller is

A— being unfeathered.
B— being feathered.
C— in the overspeed condition.
D— in the underspeed condition.

7936. Which of the following best describes the blade movement of a feathering propeller that is in the HIGH RPM position when the feathering action is begun?

A— High pitch through low pitch to feather position.
B— Low pitch through reverse pitch to feather position.
C— No movement, because a feathering propeller cannot be feathered from the HIGH RPM.
D— Low pitch through high pitch to feather position.

7937. Which of the following is normally recommended for the routine care of solid aluminum propeller blades?

A— Prevent any type of petroleum product such as fuel and oil from remaining in contact with the blades by frequently cleaning with soap and water.
B— Clean the blades with gasoline or other volatile cleaner and wipe dry with a clean, soft cloth.
C— Wash the blades with soap and water, rinse with clear water, dry thoroughly, and apply a thin coat of clean engine oil.
D— Clean the blades with a commercial caustic compound and rinse with clear water.

7938. The blade angle of a fixed-pitch propeller

A— is greatest at the tip.
B— is constant from the hub to the tip.
C— is smallest at the tip.
D— increases in proportion to the distance each section is from the hub.

7939. What determines the amount which an aluminum alloy propeller blade can be bent in face alignment and be repairable by cold straightening?

A— The thickness of the blade section at which the bend is located.
B— The chord length of the blade section at which the bend is located.
C— The linear distance from the blade tip at which the bend is located.
D— The linear distance from the propeller centerline at which the bend is located.

7940. During operational check of an aircraft using hydromatic full-feathering propellers, the following observations are made:

The feather button, after being pushed, remains depressed until the feather cycle is complete, then opens.

When unfeathering, it is necessary to manually hold the button down until unfeathering is accomplished.

A— Both feather cycle and unfeather cycle are functioning properly.
B— Both feather and unfeather cycles indicate malfunctions.
C— The feather cycle indicates a malfunction, but the unfeather cycle is correct.
D— The feather cycle is correct. The unfeather cycle indicates a malfunction.

7941. The etching process is used during propeller overhaul to

A— detect blade defects.
B— identify unairworthy components.
C— identify the blades.
D— indicate the overhauling agency name and certificate number.

7942. What controls the constant-speed range of a constant-speed propeller?

A— Engine RPM.
B— Angle of climb and descent with accompanying changes in airspeed.
C— Number of blades.
D— The mechanical limits in the propeller pitch range.

7943. For takeoff, a constant-speed propeller is normally set in the

A— HIGH PITCH, high RPM position.
B— LOW PITCH, low RPM position.
C— HIGH PITCH, low RPM position.
D— LOW PITCH, high RPM position.

7944. Where are the high and low pitch stops of a Hamilton Standard constant-speed or two-position counterweight propeller located?

A— On the face of the pitch change thrust plate.
B— In the hub and blade assembly.
C— In the counterweight assembly.
D— In the dome assembly.

7945. Which of the following statements about constant-speed counterweight propellers is also true when referring to two-position counterweight propellers?

A— Blade angle changes are accomplished by the use of two forces, one hydraulic and the other centrifugal.
B— A range of blade angle travel of either 15 or 20° is available.
C— Since an infinite number of blade angle positions are possible during flight, propeller efficiency is greatly improved.
D— The pilot selects the RPM and the propeller changes pitch to maintain the selected RPM.

7946. Most engine-propeller combinations have one or more critical ranges within which continuous operation is not permitted. Critical ranges are established to avoid

A— severe propeller vibration.
B— severe turbulence within the slipstream.
C— low or negative thrust conditions.
D— inefficient propeller pitch angles.

7947. Which of the following defects is cause for rejection of wood propellers?

A— Solder missing from screw heads securing metal tipping.
B— An oversize hub or bolthole, or elongated boltholes.
C— No moisture drain holes in metal tipping.
D— No protective coating on propeller.

7948. An aircraft's propeller system beta range

A— is used to produce zero or negative thrust.
B— is the pitch range used for cruising speeds.
C— is used to achieve maximum thrust during takeoff.
D— refers to the most fuel efficient pitch range to use at a given engine RPM.

7949. Why is it important that nicks in the leading edge of aluminum alloy blades be removed as soon as possible?

A— To localize vibratory stress.
B— Horizontal balance purposes.
C— To improve the aerodynamic characteristics of the blades.
D— To eliminate the condition where fatigue cracks can start.

7950. Major repairs to aluminum alloy propellers and blades may be done by

A— a powerplant mechanic working for a certificated A & P mechanic.
B— any propeller manufacturer.
C— an appropriately rated repair station or the manufacturer.
D— a repairman, regardless of where he/she works.

7951. The primary purpose of a cuff on a propeller is to

A— distribute anti-icing fluid.
B— strengthen the propeller.
C— gain a smoother airflow thereby reducing drag.
D— increase the flow of cooling air to the engine nacelle.

7952. The purpose of a three-way propeller valve is to

A— direct oil from the engine oil system to the propeller cylinder.
B— permit the governor to maintain on-speed condition.
C— direct oil from the engine through the governor to the propeller.
D— permit constant-speed operation of the propeller.

7953. The primary purpose of a propeller is to

A— create lift on the fixed airfoils of an aircraft.
B— build up enough slipstream to support the airfoils.
C— change engine horsepower to thrust.
D— provide static and dynamic stability of an aircraft in flight.

7954. A constant-speed propeller provides maximum efficiency by

A— increasing blade pitch as the aircraft speed decreases.
B— adjusting blade angle for most conditions encountered in flight.
C— reducing turbulence near the blade tips.
D— increasing the lift coefficient of the blade.

7955. The centrifugal twisting force acting on a propeller blade is

A— greater than the aerodynamic twisting force and tends to move the blade to a higher angle.
B— less than the aerodynamic twisting force and tends to move the blade to a lower angle.
C— less than the aerodynamic twisting force and tends to move the blade to a higher angle.
D— greater than the aerodynamic twisting force and tends to move the blade to a lower angle.

7956. Geometric pitch of a propeller is defined as the

A— effective pitch minus slippage.
B— effective pitch plus slippage.
C— angle between the blade chord and the plane of rotation.
D— angle between the blade face and the plane of rotation.

7957. Propeller blade angle is the angle between the

A— chord of the blade and the relative wind.
B— relative wind and the rotational plane of the propeller.
C— chord of the blade and the rotational plane of the propeller.
D— geometric pitch and the effective pitch.

7958. What operational force causes propeller blade tips to lag in the opposite direction of rotation?

A— Thrust-bending force.
B— Aerodynamic-twisting force.
C— Centrifugal-twisting force.
D— Torque-bending force.

7959. What operational force tends to bend the propeller blades forward at the tip?

A— Torque-bending force.
B— Aerodynamic-twisting force.
C— Centrifugal-twisting force.
D— Thrust-bending force.

7960. What are the rotational speed and blade pitch angle requirements of a constant-speed propeller during takeoff?

A— Low-speed and low-pitch angle.
B— Low-speed and high-pitch angle.
C— High-speed and low-pitch angle.
D— High-speed and high-pitch angle.

7961. (1) A mechanic certificate with a powerplant rating authorizes the holder to repair minor scars, nicks, and dents on steel propeller blades.

(2) A mechanic certificate with a powerplant rating authorizes the holder to perform minor straightening of aluminum propeller blades.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7962. (1) During takeoff, propeller thrust (pull) is greatest if the blade angle of attack is low and the engine power setting is high.

(2) With the aircraft stationary, propeller thrust is greatest if the blade angle of attack is high and the engine power setting is high.

Regarding the above statements,

A— only No. 1 is true.
B— only No. 2 is true.
C— both No. 1 and No. 2 are true.
D— neither No. 1 nor No. 2 is true.

7963. Longitudinal (fore and aft) clearance of constant-speed propeller blades or cuffs must be at least 1/2 inch (12.7 mm) between propeller parts and stationary parts of the aircraft. This clearance is with the propeller blades

A— at takeoff pitch (maximum thrust) angle.
B— feathered or in the most critical pitch configuration.
C— at cruise pitch angle.
D— at the lowest pitch angle.

7964. Holes are drilled in the metal tips of fixed-pitch wood propellers to

A— decrease weight.
B— minimize splitting along the grain of the wood.
C— balance the propeller.
D— equalize the moisture content within the blades.

7965. When running-up an engine and testing a newly installed hydromatic propeller, it is necessary to exercise the propeller by moving the governor control through its entire travel several times to

A— seat the blades fully against the low pitch stop.
B— check the minimum RPM setting of the governor.
C— free the dome of any entrapped air.
D— test the maximum RPM setting of the governor.

7966. Which of the following occurs to cause front cone bottoming during propeller installation?

A— The front cone becomes bottomed in the front propeller hub cone seat before the rear propeller hub cone seat has engaged the rear cone.
B— The front cone becomes bottomed in the front propeller hub cone seat before the retaining nut has engaged sufficient threads to be safetied properly.
C— The front cone enters the front propeller hub cone seat at an angle causing the propeller retaining nut to appear tight when it is only partially tightened.
D— The front cone contacts the ends of the shaft splines, preventing the front and rear cones from being tightened against the cone seats in the propeller hub.

7967. A damaged piston-to-dome seal in a hydromatic propeller will most likely be indicated by which of the following?

A— Oil deposits on the propeller hub and blades.
B— A heavy oil deposit on the engine nose case and cowling with little, if any, oil on the blades.
C— Oil deposits on the blades and the outer portions of the engine cowling with no oil on the propeller hub.
D— Sluggish operation of the pitch change mechanism.

7968. During the installation of a hydromatic propeller, the blades should be in what position when the dome is to be installed?

A— Reverse pitch.
B— Full-feathered.
C— Low pitch.
D— High pitch.

7969. What is indicated when the front cone bottoms while installing a propeller?

A— Propeller retaining nut torque is correct.
B— Propeller-dome combination is incorrect.
C— Blade angles are incorrect.
D— Rear cone should be moved forward.

7970. How is the oil pressure delivery on a hydromatic propeller normally stopped after the blades have reached their full-feathered position?

A— Pulling out the feathering push button.
B— Electric cutout pressure switch.
C— High-angle stop ring in the base of the fixed cam.
D— Stop lugs in the teeth of the rotating cam.

7971. Incorrect pitch change gear preload on a hydromatic propeller will cause

A— insufficient drag to be exerted on the blades, resulting in erratic tracking.
B— excessive clearances between the blade and spider.
C— excessive binding or backlash of the gear teeth.
D— the propeller to become loose on the shaft after operation.

7972. The primary purpose of the front and rear cones for propellers that are installed on splined shafts is to

A— position the propeller hub on the splined shaft.
B— prevent metal-to-metal contact between the propeller and the splined shaft.
C— reduce stresses between the splines of the propeller and the splines of the shaft.
D— balance the propeller aerodynamically.

7973. Which of the following statements concerning the installation of a new fixed-pitch wood propeller is true?

A— If the hub flange is integral with the crankshaft, final track should be made before the propeller is installed.
B— If a separate metal hub is used, final track should be accomplished prior to installing the hub in the propeller.
C— NAS close-tolerance bolts should be used to install the propeller.
D— Inspect the bolts for tightness after the first flight and again after the first 25 hours of flying.

7974. If the propeller cones or the hub cone seats show evidence of galling and wear, the most likely cause is

A— the cones and cone seats were not properly lubricated during previous operation.
B— the pitch change stops were located incorrectly, causing the cone seats to act as the high pitch stop.
C— the propeller retaining nut was not tight enough during previous operation.
D— the front cone was not fully bottomed against the crankshaft splines during installation.

7975. On aircraft equipped with hydraulically operated constant-speed propellers, all ignition and magneto checking is done with the propeller in which position?

A— High RPM.
B— Normal cruising range.
C— Low RPM.
D— High pitch range.

7976. Oil leakage around the rear cone of a hydromatic propeller usually indicates a defective

A— piston gasket.
B— blade-barrel packing.
C— spider-shaft oil seal.
D— dome-barrel oil seal.

7977. Maximum taper contact between crankshaft and propeller hub is determined by using

A— a telescoping gauge.
B— bearing blue color transfer.
C— a micrometer.
D— a surface gauge.

7978. Propeller blade tracking is the process of determining

A— the plane of rotation of the propeller with respect to the aircraft longitudinal axis.
B— that each blade will have the same angle of attack to prevent vibration.
C— that the blade angles are within the specified tolerance of each other.
D— the positions of the tips of the propeller blades relative to each other.

7979. What is the basic purpose of the three small holes (No. 60 drill) in the tipping of wood propeller blades?

A— To provide a means for inserting balancing shot when necessary.
B— To provide a means for periodically impregnating the blade with preservation materials.
C— To allow the moisture which may collect between the tipping and the wood to escape (vent the tipping).
D— To allow the moisture content of each blade to equalize.

7980. A fixed-pitch wooden propeller that has been properly installed and the attachment bolts properly torqued exceeds the out-of-track allowance by 1/16 inch. The excessive out-of-track condition may be corrected by

A— slightly overtightening the attachment bolts adjacent to the most forward blade.
B— discarding the propeller since out-of-track conditions cannot be corrected.
C— re-profiling the blades to correct for unequal aerodynamic forces.
D— placing shims between the inner flange and the propeller.

7981. Manually feathering a hydromechanical propeller means to

A— block governor oil pressure to the cylinder of the propeller.
B— port governor oil pressure to the cylinder of the propeller.
C— port governor oil pressure from the cylinder of the propeller.
D— block governor oil pressure in the cylinder of the propeller.

7982. In what position is the constant-speed propeller control placed to check the magnetos?

A— Full decrease, low propeller blade pitch angle.
B— Full increase, high propeller blade pitch angle.
C— Full increase, low propeller blade pitch angle.
D— Full decrease, high propeller blade pitch angle.

7983. The propeller-feathering pump is shut off

A— 15 seconds after depressing the feather button switch.
B— by a micro switch in the propeller governor.
C— by an oil pressure switch.
D— when the propeller piston activates the limit switch.

APPENDIX 1

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AVIATION MECHANIC POWERPLANT
SUBJECT MATTER KNOWLEDGE CODES

To determine the knowledge area in which a particular question was incorrectly answered, compare the subject matter code(s) on AC Form 8080-2, Airmen Written Test Report, to the subject matter outline that follows. The total number of test items missed may differ from the number of subject matter codes shown on the AC Form 8080-2, since you may have missed more than one question in a certain subject matter code.

Reciprocating Engines

A01	Inspect and repair 14-cylinder or larger radial engine
A02	Overhaul reciprocating engine
A03	Inspect, check, service, and repair opposed and radial engines and reciprocating engine installations
A04	Install, troubleshoot, and remove reciprocating engines

Turbine Engines

B01	Overhaul turbine engine
B02	Inspect, check, service, and repair turbine engines and turbine engine installations
B03	Install, troubleshoot, and remove turbine engines

Engine Inspection

C01	Perform powerplant conformity and airworthiness inspections
DXX	Reserved
EXX	Reserved
FXX	Reserved
GXX	Reserved

Engine Instrument Systems

H01	Troubleshoot, service, and repair fluid rate-of-flow indicating systems
H02	Inspect, check, service, troubleshoot, and repair engine temperature, pressure, and RPM indicating systems

Engine Fire Protection Systems

I01	Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems

Engine Electrical Systems

J01	Repair engine electrical system components
J02	Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices

Lubrication Systems

K01	Identify and select lubricants
K02	Repair engine lubrication system components
K03	Inspect, check, service, troubleshoot, and repair engine lubrication systems

Ignition Systems

L01	Overhaul magneto and ignition harness
L02	Repair engine ignition system components
L03	Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine ignition systems

Fuel Metering Systems

M01	Inspect, check, and service water injection systems
M02	Overhaul carburetor
M03	Repair engine fuel metering system components
M04	Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems

Engine Fuel Systems

N01	Repair engine fuel system components
N02	Inspect, check, service, troubleshoot, and repair engine fuel systems

Induction Systems

O01	Inspect, check, troubleshoot, service, and repair engine ice and rain control systems
O02	Inspect, check, service, and repair heat exchangers and superchargers
O03	Inspect, check, service, and repair carburetor air intake and induction manifolds

Engine Cooling Systems

P01	Repair engine cooling system components
P02	Inspect, check, troubleshoot, service, and repair engine cooling systems

Engine Exhaust Systems

Q01	Repair engine exhaust system components
Q02	Inspect, check, troubleshoot, service, and repair engine exhaust systems

Propellers

R01	Inspect, check, service, and repair propeller synchronizing and ice control systems
R02	Identify and select propeller lubricants
R03	Balance propellers
R04	Repair propeller control system components
R05	Inspect, check, service, and repair fixed pitch, constant speed and feathering propellers, and propeller governing systems
R06	Install, troubleshoot, and remove propellers

NOTE: AC 00-2, Advisory Circular Checklist, transmits the status of all FAA advisory circulars (AC's), as well as FAA internal publications and miscellaneous flight information such as AIM, Airport/Facility Directory, written test question books, practical test standards, and other material directly related to a certificate or rating. To obtain a free copy of the AC 00-2, send your request to:

U.S. Department of Transportation
Utilization and Storage Section, M-443.2
Washington, DC 20590

ABBREVIATIONS AND REFERENCES

The following abbreviations are used to identify the reference associated with each test question listed in appendix 1.

ABS	—	Aircraft Basic Science - McGraw-Hill Book Co.
AC	—	Advisory Circular
AEE	—	Aircraft Electricity and Electronics - McGraw-Hill Book Co.
AMR	—	Aircraft Maintenance and Repair - McGraw-Hill Book Co.
AP	—	Aircraft Powerplants - McGraw-Hill Book Co.
APP	—	Aerospace Propulsion Powerplants - Educational Publishers, Inc.
EA-APC	—	Aircraft Propellers and Controls - International Aviation Publishers (IAP), Inc.
EA-ATD-2	—	Aircraft Technical Dictionary - IAP, Inc.
EA-ITP-AB	—	Airframe Section Textbook - IAP, Inc.
EA-ITP-GB	—	General Section Textbook - IAP, Inc.
EA-ITP-P	—	Powerplant Section Textbook - IAP, Inc.
EA-TEP-2	—	Aircraft Gas Turbine Powerplants - IAP, Inc.
FAR	—	Federal Aviation Regulations

QUESTIONS AND REFERENCES

A01:
7001. AC 65-12A
7002. AC 65-12A
7003. AC 65-12A
7004. AC 65-12A
7005. AC 65-12A
7006. AC 65-12A
7007. AC 65-12A
7008. AC 65-12A
7009. AC 65-12A
7010. AC 65-12A

A02:
7011. AP
7012. AC 65-12A
7013. AC 65-12A
7014. AC 65-12A
7015. AC 65-12A
7016. AP
7017. AC 65-12A
7018. AC 65-12A
7019. AC 65-12A
7020. AP
7021. EA-ITP-P
7022. AC 65-12A
7023. AP
7024. AP
7025. AC 65-12A
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7047. AC 65-12A
7048. AP

A03:
7049. AC 65-12A
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7052. AC 65-12A
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7054. FAR 43
7055. EA-ITP-P
7056. AC 65-12A
7057. AC 65-12A
7058. AC 65-12A
7059. AC 65-12A
7060. AP
7061. AC 65-12A
7062. AC 65-12A
7063. AC 65-12A
7064. AC 65-12A
7065. AC 65-12A
7066. AC 65-12A
7067. APP
7068. AC 65-12A
7069. AC 43.13-1A
7070. AC 65-9A
7071. AC 65-12A
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7088. AP
7089. AP

A04:
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7111. EA-ITP-P
7112. AP

B01:
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7138. AC 65-12A
7139. AC 65-12A
7140. AC 65-12A
7141. FAR 33
7142. EA-TEP-2
7143. EA-TEP-2
7144. EA-TEP-2
7145. FAR 121.25, 121.133 & 121.135
7146. FAR 33.4
7147. EA-ITP-P

B02:

7148. AC 65-12A
7149. EA-ITP-P
7150. AC 65-12A
7151. AC 65-12A
7152. AC 65-15A
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7154. AC 65-12A
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7183. EA-ITP-P
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7217. AC 65-12A
7218. EA-ITP-P
7219. EA-ITP-P
7220. AC 65-12A
7221. AC 65-12A
7222. AC 65-12A
7223. AC 65-12A
7224. AC 65-12A
7225. AC 65-12A
7226. AC 65-12A
7227. AC 65-12A
7228. AC 65-12A
7229. EA-ITP-P
7230. EA-ITP-P
7231. AC 65-12A
7232. AC 65-12A
7233. AC 65-12A
7234. EA-TEP-2
7235. EA-TEP-2
7236. AP
7237. AP
7238. EA-ITP-P

C01:

7239. AC 39-7B
7240. EA-ITP-GB
7241. AC 65-12A
7242. AC 65-12A
7243. AC 65-9A
7244. FAR 43
7245. FAR 39.3 & AC 39-7B
7246. EA-ITP-GB
7247. FAR 43
7248. AC 65-12A
7249. EA-ITP-GB
7250. AC 43.13-1A
7251. AC 65-12A
7252. FAR 23.903
7253. AC 65-12A
7254. AC 65-12A
7255. AC 65-9A
7256. FAR 65.95
7257. FAR 43
7258. FAR 23
7259. FAR 43.13
7260. FAR 43.9
7261. FAR 43.13a
7262. AC 65-9A
7263. FAR 23
7264. AC 65-12A
7265. FAR 33
7266. EA-ITP-P
7267. AP

H01:

7268. AC 65-12A
7269. AC 65-15A
7270. AC 65-12A
7271. AC 65-15A
7272. AC 65-15A
7273. AC 65-12A
7274. EA-ITP-P
7275. AEE
7276. EA-ITP-P
7277. EA-ITP-P

H02:

7278. AC 65-12A
7279. AP
7280. AC 65-15A
7281. AC 65-15A
7282. AC 65-15A
7283. AC 65-12A
7284. AC 65-12A
7285. AC 65-15A
7286. AC 65-12A
7287. AC 65-12A
7288. AC 65-12A
7289. AC 65-15A
7290. AC 65-15A
7291. AP
7292. AC 65-12A
7293. AC 65-12A
7294. AC 65-12A
7295. AC 65-12A
7296. AC 65-15A
7297. EA-ITP-P
7298. AC 65-12A
7299. AC 65-15A
7300. AC 65-15A
7301. AC 65-12A
7302. FAR 65.81
7303. AC 65-15A
7304. AC 65-12A
7305. AC 65-12A
7306. AP
7307. EA-ITP-P
7308. EA-ITP-P
7309. AC 65-12A
7310. AC 65-12A
7311. AC 65-12A
7312. AC 65-12A
7313. AC 65-12A
7314. AC 65-12A
7315. AC 65-12A
7316. AMR
7317. EA-ITP-P
7318. EA-ITP-P
7319. AP
7320. AC 20-88A

I01:

7321. AC 65-12A
7322. AC 65-12A
7323. AC 65-12A
7324. AC 65-12A
7325. AC 65-12A
7326. AC 65-12A
7327. AC 65-15A
7328. AC 65-12A
7329. AC 65-12A
7330. AC 65-15A
7331. AC 65-12A
7332. AC 65-12A
7333. AC 65-12A
7334. AC 65-15A
7335. AC 65-15A
7336. AC 65-12A
7337. AP
7338. AC 65-12A

7339. AC 65-15A
7340. AC 65-15A
7341. AC 65-12A
7342. AC 65-12A
7343. AC 65-9A
7344. AC 65-12A
7345. AC 65-15A
7346. AC 65-15A
7347. AC 65-12A
7348. AC 65-12A
7349. AMR
7350. ABS
7351. EA-ITP-P
7352. AC 65-12A

J01:

7353. AEE
7354. AC 65-9A
7355. AC 65-9A
7356. AC 65-12A
7357. AC 65-9A
7358. AC 65-9A
7359. AC 65-9A
7360. AC 65-9A
7361. AC 65-9A
7362. AC 65-9A
7363. AC 65-9A
7364. AEE
7365. FAR 25.1351
7366. AC 65-9A
7367. AC 65-9A
7368. AC 65-9A
7369. AC 65-15A
7370. AEE
7371. AC 65-9A
7372. AEE
7373. EA-ITP-P
7374. AEE
7375. AEE
7376. AEE
7377. AEE
7378. EA-ITP-P
7379. EA-ITP-P
7380. EA-ITP-P
7381. EA-ITP-P
7382. AP
7383. EA-ITP-AB
7384. EA-ITP-GB
7385. AEE

J02:

7386. AC 43.13-1A
7387. AC 65-12A
7388. AC 43.13-1A
7389. AC 43.13-1A
7390. AC 65-12A
7391. AC 65-12A
7392. AEE
7393. AEE
7394. AC 65-9A
7395. AC 65-12A
7396. AC 65-12A
7397. AP
7398. AC 43.13-1A
7399. AC 65-12A
7400. AC 65-12A
7401. AC 43.13-1A
7402. AC 43.13-1A
7403. AC 65-12A
7404. AC 43.13-1A
7405. AC 43.13-1A
7406. EA-ITP-P
7407. EA-ITP-P
7408. EA-ITP-P
7409. EA-ITP-P
7410. EA-ITP-P
7411. FAR 23.1357
7412. EA-ITP-P
7413. EA-ITP-P
7414. EA-ITP-P
7415. EA-ITP-P
7416. EA-ITP-P
7417. EA-ITP-AB
7418. EA-ITP-P
7419. EA-ITP-P
7420. AEE
7421. EA-ITP-P

K01:

7422. AC 65-12A
7423. AC 65-12A
7424. AC 65-15A
7425. AC 65-12A
7426. AP
7427. AC 65-12A
7428. AC 65-12A
7429. AC 65-12A
7430. AC 65-12A
7431. AP
7432. AC 65-12A
7433. AC 65-12A
7434. AC 65-12A
7435. AC 65-12A
7436. AC 65-12A
7437. AC 65-12A
7438. AC 65-12A
7439. AC 65-12A
7440. AP
7441. AP
7442. AP
7443. EA-TEP-2
7444. EA-ITP-P
7445. EA-ITP-P

K02:

7446. EA-TEP-2
7447. EA-ITP-P
7448. AC 65-12A
7449. AC 65-12A
7450. AC 65-12A
7451. AC 65-12A
7452. AP
7453. EA-TEP-2
7454. AC 65-12A
7455. AC 65-12A
7456. AC 65-12A
7457. AC 65-12A
7458. AC 65-12A
7459. AC 65-12A
7460. FAR 33.71
7461. FAR 33.71
7462. AC 65-12A
7463. EA-TEP-2
7464. AC 65-12A
7465. AC 65-12A
7466. AC 65-12A
7467. AC 65-12A
7468. AC 65-12A
7469. EA-ITP-P

K03:

7470. EA-ITP-P
7471. AC 65-12A
7472. AC 65-12A
7473. AC 65-12A
7474. AC 65-12A
7475. AP
7476. AC 65-12A
7477. AC 65-12A
7478. AP
7479. AC 65-12A
7480. AC 65-12A
7481. EA-ITP-P
7482. AC 65-12A
7483. AC 65-12A
7484. AC 65-12A
7485. AP
7486. AC 65-12A
7487. AC 65-12A
7488. AC 65-12A
7489. AC 65-12A
7490. AC 65-12A
7491. AC 65-12A
7492. AC 65-12A
7493. AC 65-12A
7494. AP
7495. AC 65-12A
7496. AC 65-12A
7497. AC 65-12A
7498. AC 65-12A
7499. AC 65-12A
7500. AC 65-12A
7501. AC 65-12A
7502. AC 65-12A
7503. AC 65-12A
7504. AC 65-12A
7505. AC 65-12A
7506. AC 65-12A
7507. AC 65-12A
7508. AC 65-12A
7509. AC 65-12A
7510. AC 65-12A
7511. FAR 23.1013
7512. EA-TEP-2
7513. AC 65-12A
7514. AC 65-12A
7515. AC 65-12A

L01:

7516. AP
7517. AC 65-12A
7518. AC 65-12A
7519. AC 65-12A
7520. AC 65-12A
7521. AP
7522. AC 65-12A
7523. AP
7524. AC 65-12A
7525. AC 65-12A
7526. AC 65-12A
7527. AC 65-12A
7528. EA-ITP-P
7529. AC 65-12A
7530. AC 65-12A
7531. EA-ITP-P
7532. AC 65-12A
7533. AC 65-12A
7534. AC 65-12A
7535. AC 65-12A
7536. AC 65-12A
7537. AC 65-12A
7538. AC 65-12A
7539. AP
7540. AC 65-12A
7541. AC 65-12A
7542. AC 65-12A
7543. AC 65-12A
7544. AC 65-12A
7545. AC 65-12A
7546. AC 65-12A
7547. AP
7548. AC 65-12A & AP
7549. AC 65-12A
7550. AC 65-12A
7551. AC 65-12A
7552. AC 65-12A

7553. AC 65-12A
7554. AP
7555. AP
L02:
7556. EA-ITP-P
7557. AC 65-12A
7558. AC 65-12A
7559. AP
7560. AC 65-12A
7561. AC 65-12A
7562. AC 65-12A
7563. AP
7564. AC 65-12A
7565. AC 65-12A
7566. AC 65-12A
7567. AC 65-12A
7568. AP & EA-ITP-P
7569. AEE
7570. AC 65-12A
7571. AC 65-12A
7572. AC 65-12A
7573. AC 65-12A
7574. EA-TEP-2
7575. EA-TEP-2
7576. AP
7577. EA-ITP-P
7578. EA-ITP-P
L03:
7579. AC 65-12A
7580. AP
7581. AC 65-12A
7582. AC 65-12A
7583. AC 65-12A
7584. AC 65-12A
7585. AC 65-12A
7586. AC 65-12A
7587. AC 65-12A
7588. AC 65-12A
7589. AP
7590. AC 65-12A
7591. AP
7592. AC 65-12A
7593. AC 65-12A
7594. AC 65-12A
7595. AP
7596. AC 65-12A
7597. EA-ITP-P
7598. AC 65-12A
7599. AP
7600. AC 65-12A
7601. AC 65-12A
7602. AC 65-12A
7603. AC 65-12A
7604. AC 65-12A
7605. AC 65-12A
7606. AC 65-12A
7607. AC 65-12A
7608. AC 65-12A
7609. AC 65-12A
7610. AC 65-12A
7611. AC 65-12A
7612. AC 65-12A
7613. AC 65-12A
7614. AC 65-12A
7615. AC 65-12A
7616. EA-ITP-P
7617. AC 65-12A
7618. AC 65-12A
7619. AC 65-12A
7620. AC 65-15A
7621. AP
7622. AC 65-12A
7623. AC 65-12A
7624. AC 65-12A
7625. AC 65-12A
7626. AC 65-12A
7627. AC 65-12A
7628. AC 65-12A
7629. AC 65-12A
7630. AC 65-12A
7631. AC 65-12A
7632. AC 65-12A
7633. AC 65-12A
7634. AP
M01:
7635. AC 65-12A
7636. AC 65-12A
7637. AP
7638. AC 65-12A
7639. AC 65-12A
7640. AC 65-12A
7641. AC 65-12A
M02:
7642. EA-ITP-P
7643. AC 65-12A
7644. AC 65-12A
7645. AC 65-12A
7646. AC 65-12A
7647. AC 65-12A
7648. AC 65-12A
7649. EA-ITP-P
7650. AP
7651. EA-ITP-P
7652. AC 65-12A
7653. AP
7654. AC 65-12A
7655. AC 65-12A
7656. AC 65-12A
7657. AC 65-12A
7658. AC 65-12A
7659. AC 65-12A
7660. AC 65-12A
7661. AC 65-12A
7662. AC 65-12A
7663. AP
7664. AC 65-12A
7665. AC 65-12A
7666. AC 65-12A
7667. AP
7668. AC 65-12A
7669. EA-ITP-P
7670. AP
7671. AP
7672. AC 65-12A
7673. EA-ITP-P
7674. AC 65-12A
7675. AC 65-12A
7676. AC 65-12A
7677. AC 65-12A
7678. AC 65-12A
7679. AC 65-12A
7680. AC 65-12A
7681. AP
7682. AC 65-12A
7683. AC 65-12A
7684. AC 65-12A
M03:
7685. AC 65-12A
7686. AP
7687. EA-ITP-P
7688. AC 65-12A
7689. AC 65-12A
7690. AC 65-12A
7691. AC 65-12A
7692. AC 65-12A
7693. EA-ITP-P
7694. AC 65-12A
7695. AC 65-12A
7696. AC 65-12A
7697. AC 65-12A
7698. AC 65-12A
7699. AC 65-12A
7700. AC 65-12A
7701. AC 65-12A
7702. AP & EA-ITP-P
7703. AP
M04:
7704. AC 65-12A
7705. AC 65-12A
7706. AC 65-12A
7707. AC 65-12A
7708. AP
7709. AC 65-12A
7710. AP
7711. AC 65-12A
7712. AC 65-12A
7713. AC 65-12A
7714. AP
7715. AC 65-12A
7716. AC 65-12A
7717. AC 65-12A
7718. AC 65-12A
7719. AC 65-12A
7720. AC 65-9A
7721. AC 65-12A
7722. AC 65-12A
7723. AC 65-12A
7724. AC 65-12A
7725. AC 65-12A
7726. AC 65-12A
7727. EA-ITP-P
7728. AC 65-12A
7729. AC 65-12A
7730. AC 65-12A
7731. EA-ITP-P
7732. AP
7733. EA-ITP-P
7734. AC 65-12A
N01:
7735. AC 65-9A
7736. AC 65-12A
7737. FAR 23.995
7738. AC 65-9A
7739. AC 65-9A
7740. AC 65-9A
7741. AC 65-9A
7742. AC 65-9A
7743. AC 65-9A
7744. AC 65-9A
7745. AC 65-9A
7746. AP
N02:
7747. AP
7748. FAR 23.1189
7749. AC 65-9A
7750. AC 43.13-1A
7751. AC 65-9A
7752. FAR 23.955
7753. AC 65-9A
7754. AC 65-9A
7755. AC 65-9A
7756. AC 65-9A
7757. AC 65-12A
7758. AC 65-9A
7759. AP
7760. AP 65-9A
7761. AC 65-9A
7762. AC 65-9A
7763. AC 65-9A
7764. AP

7765. AP
7766. AC 65-12A
7767. AC 65-12A
7768. AC 65-12A
7769. AP & EA-ITP-P
7770. EA-ITP-P
7771. EA-ITP-P
7772. EA-ITP-P
7773. EA-ITP-P
7774. EA-ITP-P
7775. EA-ITP-P
O01:
7776. AP
7777. AC 65-9A
7778. AC 65-12A
7779. AC 65-12A
7780. AC 65-12A
7781. AC 65-12A
7782. AC 65-12A
7783. AC 65-12A
O02:
7784. AC 65-12A
7785. AC 65-12A
7786. AC 65-12A
7787. AC 65-12A
7788. AC 65-12A
7789. EA-ITP-P
7790. AC 43.13-1A
7791. AC 65-12A
7792. AC 65-12A
7793. AC 65-12A
7794. AC 65-12A
7795. AC 65-12A
7796. AC 65-12A
7797. AC 65-12A
7798. AC 65-12A
7799. AC 65-12A
7800. AC 65-12A
7801. EA-ITP-P
7802. AC 65-12A
7803. AC 65-12A
O03:
7804. AP
7805. AC 65-12A
7806. AC 65-12A
7807. AP
7808. AC 65-12A
7809. EA-ITP-P
7810. EA-ITP-P
7811. AC 65-9A
7812. EA-ITP-P
7813. AC 65-12A
7814. AC 65-12A
P01:
7815. AC 65-12A
7816. AC 65-12A
7817. AC 65-12A
7818. AC 65-12A
7819. AC 65-12A
7820. AC 65-12A
7821. AC 65-12A
7822. EA-ITP-P
7823. EA-ITP-P
7824. AC 65-12A
P02:
7825. AC 65-12A
7826. AC 65-12A
7827. EA-ITP-P
7828. AC 65-12A
7829. AC 65-12A
7830. AC 65-12A
7831. AC 65-12A
7832. AP
7833. AC 65-12A
7834. AP
7835. AP
7836. AC 65-12A
7837. AC 65-12A
7838. AC 65-12A
7839. AC 65-12A
7840. AC 65-12A
7841. AP
7842. ABS
7843. AC 65-12A
7844. AC 65-12A
7845. AC 65-12A
7846. AC 65-12A
7847. AC 65-12A
Q01:
7848. AC 65-12A
7849. EA-ITP-P
7850. EA-ITP-P
7851. AC 65-12A
7852. AC 65-12A
7853. AC 65-12A
7854. AC 43.13-1A
7855. AC 43.13-1A
7856. AC 65-12A
Q02:
7857. AC 65-12A
7858. AC 65-12A
7859. AC 65-12A
7860. AC 43.13-1A
7861. AC 65-12A
7862. AC 65-12A
7863. AC 65-12A
7864. AC 65-12A
7865. AC 65-12A
7866. AC 65-12A
7867. AC 65-12A
7868. AC 65-12A
7869. AC 65-12A
7870. AC 43.13-1A
7871. AC 43.13-1A
7872. AC 43.13-1A
7873. AC 43.13-1A
7874. EA-ITP-P
7875. AC 43.13-1A
R01:
7876. AC 65-12A
7877. AC 65-12A
7878. AC 65-12A
7879. AC 65-12A
7880. AC 65-12A
7881. AC 65-12A
7882. AC 65-12A
7883. EA-APC
7884. EA-ITP-P
R02-R03:
7885. AC 65-12A
7886. AP
7887. AC 65-12A
7888. AC 65-12A
7889. AC 43.13-1A
7890. AC 43.13-1A
7891. AC 65-12A
7892. AC 65-12A
7893. AC 65-12A
R04:
7894. AC 65-12A
7895. AC 65-12A
7896. AC 65-12A
7897. AC 65-12A
7898. AC 65-12A
7899. AC 65-12A
7900. AC 65-12A
7901. AC 65-12A
7902. AC 65-12A
7903. AC 65-12A
7904. AC 65-12A
7905. AC 65-12A
7906. AC 65-12A
R05:
7907. AC 65-12A
7908. AC 65-12A
7909. AC 65-12A
7910. AC 65-12A
7911. AC 65-9A
7912. AC 43.13-1A
7913. AC 65-12A
7914. AC 65-12A
7915. AP
7916. AC 65-12A
7917. AC 65-12A
7918. AC 65-12A
7919. AC 65-12A
7920. AC 65-12A
7921. AC 65-12A
7922. AC 65-12A
7923. AC 65-12A
7924. AC 65-12A
7925. AC 65-12A
7926. AC 65-12A
7927. AC 65-12A
7928. AC 65-12A
7929. AC 65-12A
7930. AC 65-12A
7931. AC 65-12A
7932. AC 65-12A
7933. AC 65-12A
7934. AC 65-12A
7935. AC 65-12A
7936. AC 65-12A
7937. AC 65-12A
7938. AC 65-12A
7939. AC 43.13-1A & EA-ITP-P
7940. AC 65-12A
7941. AC 43.13-1A
7942. EA-ITP-P
7943. EA-ITP-P
7944. AP
7945. AC 65-12A
7946. EA-ITP-P
7947. EA-ITP-P
7948. EA-ATD-2
7949. AP
7950. EA-ITP-P
7951. AC 65-12A
7952. AC 65-12A
7953. AC 65-12A
7954. AC 65-12A
7955. AC 65-12A
7956. AP
7957. AC 65-12A
7958. AC 65-12A
7959. AC 65-12A
7960. AC 65-12A
7961. FAR 65.81 & 43 App A
7962. AC 65-12A
7963. AP
R06:
7964. AC 65-12A
7965. AC 65-12A
7966. AC 65-12A
7967. EA-ITP-P
7968. EA-ITP-P
7969. AC 65-12A
7970. AC 65-12A

7971. AC 65-12A
7972. EA-ITP-P
7973. AC 43.13-1A
7974. AC 65-12A
7975. AC 65-12A
7976. AC 65-12A
7977. EA-ITP-P
7978. AC 65-12A
7979. AC 65-12A
7980. EA-ITP-P
7981. AC 65-12A
7982. AC 65-12A
7983. AC 65-12A

APPENDIX 2

CONTAINER PRESSURE VERSUS TEMPERATURE		
TEMPERATURE °F	CONTAINER PRESSURE (PSIG)	
	MINIMUM	MAXIMUM
-40	60	145
-30	83	165
-20	105	188
-10	125	210
0	145	230
10	167	252
20	188	275
30	209	295
40	230	317
50	255	342
60	284	370
70	319	405
80	356	443
90	395	483
100	438	523

FIGURE 1.—Fire Extinguisher Pressure Chart.

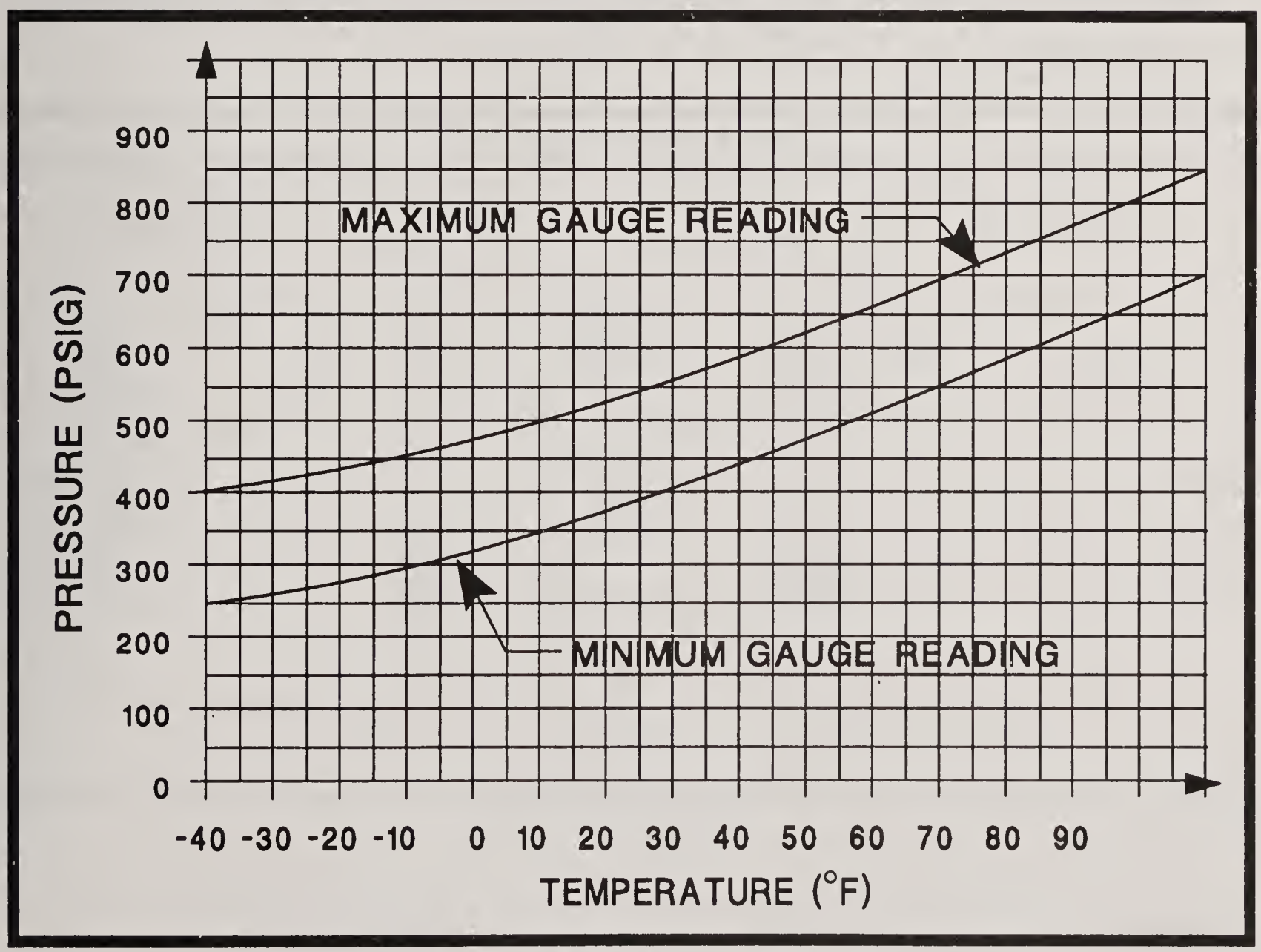

FIGURE 2.—Fire Extinguisher Pressure Chart.

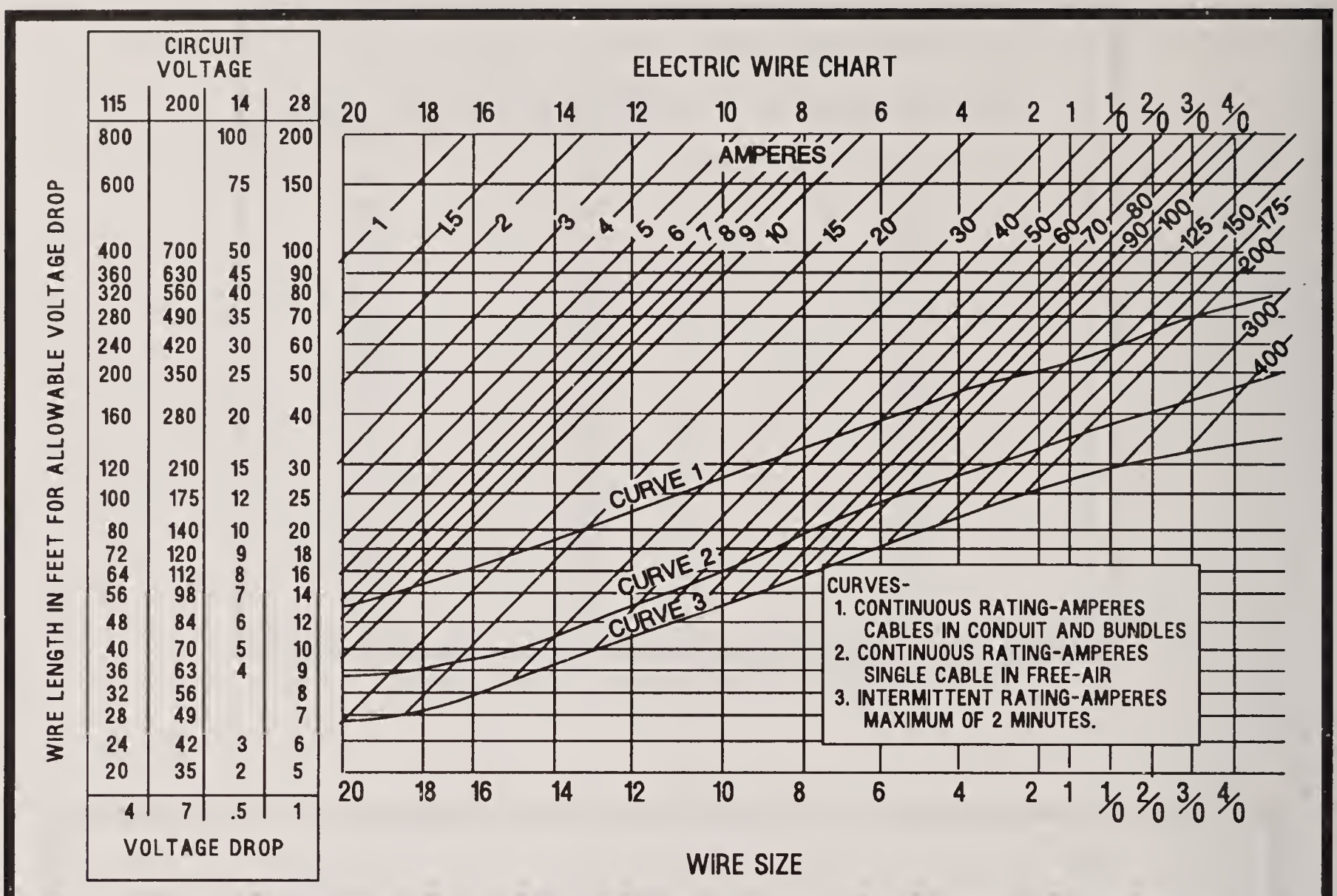

FIGURE 3.—Electric Wire Chart.

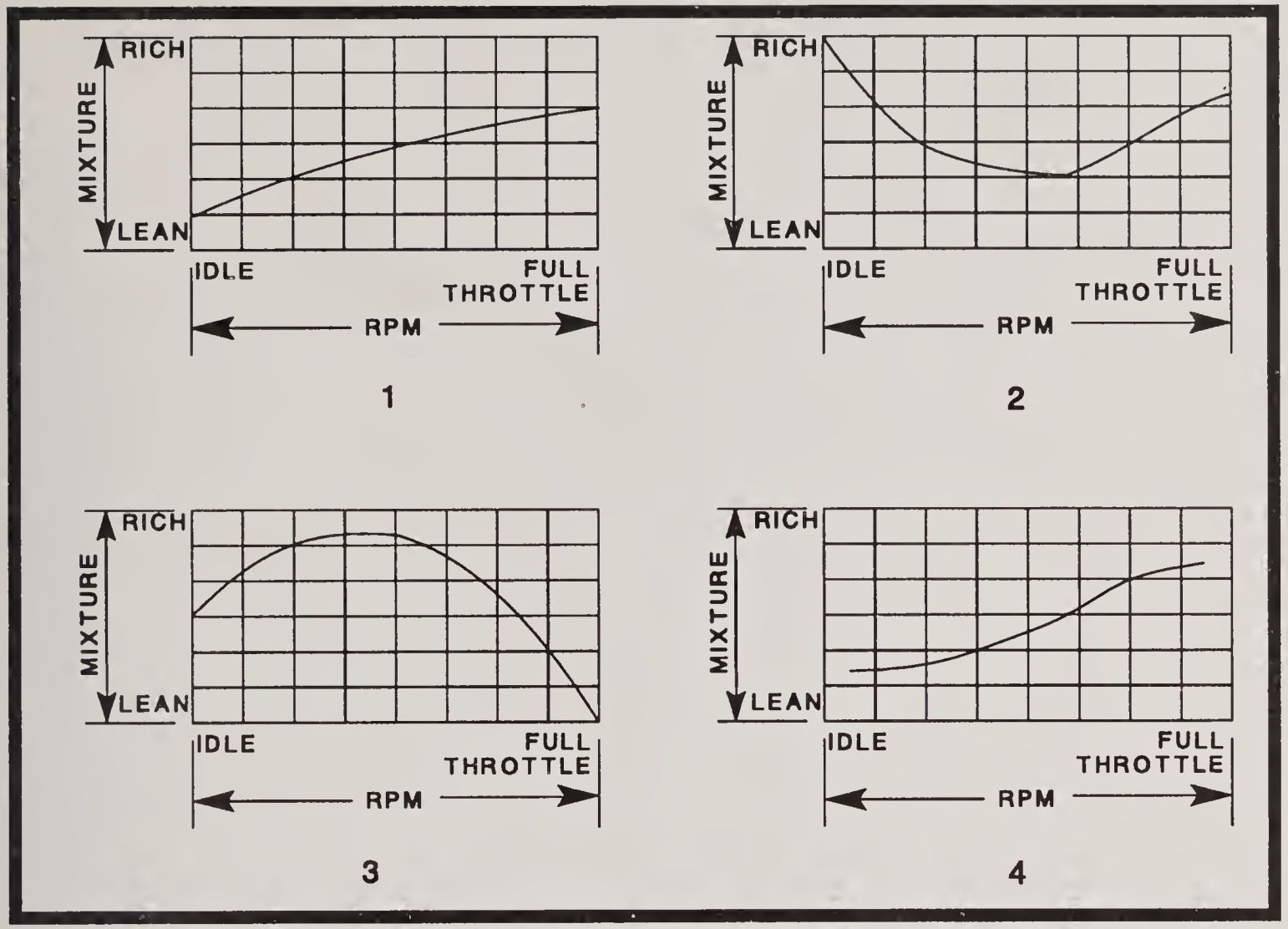

FIGURE 4.—Fuel/Air Ratio Graphs.

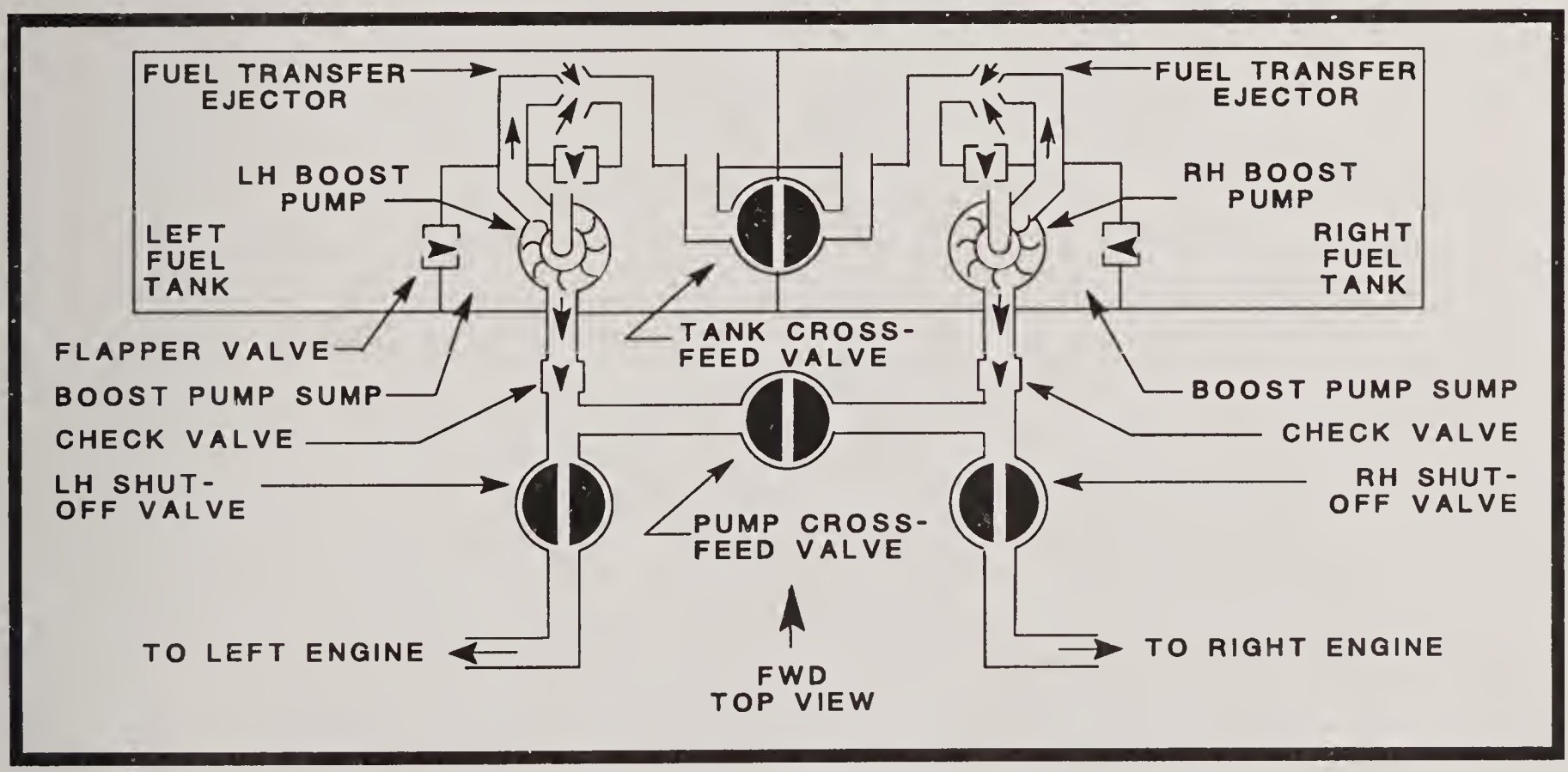

FIGURE 5.—Fuel System.